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# USSR Report

TRANSPORTATION

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USSR REPORT  
TRANSPORTATION

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## CIVIL AVIATION

### MINISTRY OFFICIAL ON IMPROVING ALL-WEATHER AVIATION CAPABILITIES

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 12, Dec 83 pp 14-15

[Article by T. Anodina, chief of the Radio Electronic Equipment Main Administration of the Ministry of Civil Aviation, doctor of technical sciences, and professor: "On the Path Toward All-Weather Capability"]

[Text] As is well known, the takeoff and landing are the most complex stages of flight. High levels of nervous and emotional stress on crews are characteristic, and they can be reduced only by automating the processes of controlling the aircraft. On the other hand, statistics show that flight regularity also depends basically on these two stages--more than two-thirds of flight schedule disruptions result from the absence of the necessary weather conditions for takeoff and landing.

In compliance with the standards now in effect to permit landings under the conditions of ICAO [International Civil Aviation Organization] Category I and II minimums, a combination of ground-based facilities is being used--course and glideslope radiobeacons which provide sensors with data on the approach path and deviations from it, high-intensity lighting systems which help to visually determine the position of an aircraft, radar stations which monitor the accuracy of a landing approach, and the appropriate weather instrumentation. Automation of the processes of controlling an aircraft which is nearing the ground also is provided by on-board equipment--an automatic control system which leads the aircraft along an assigned glidepath, course and glideslope receivers which receive data from ground-based radiobeacons, and radioaltimeters which determine the true altitude of flight with high accuracy.

Landing systems in the metric-wave band are widely used by civil aircraft of all countries as the basic course and glideslope facility. In the Soviet Union airports being developed with landing facilities also are being equipped with the similar SP-70, SP-75 and SP-80 systems. At the same time, they are being used both as replacement for the SP-50, SP-50M and SP-68 equipment, which has become obsolete, as well as for equipping airports which do not yet have metric-wave landing systems.

Work is being conducted on a broad front to improve these facilities in conformity with a long-range plan for the development of airports and aviation equipment. In particular, a new antenna system has been developed for the glideslope radiobeacon which provides for better operational characteristics at airports with a significant number of ground structures and complex local topography.

Lighting equipment serves as the most important component in the combination of airport facilities for landing under restricted weather minimums. The modern D-2 and "Svecha-3" high-intensity lighting systems are being used at the overwhelming majority of main airports in our country. According to their technical data, they are in full compliance with the requirements of ICAO Categories I and II.

It is characteristic that the systems for arranging the lights standardized by ICAO have not undergone any serious changes for several decades. This proves that the lighting systems being used, which ensure flight safety under poor weather conditions to the full extent, are the best ones. For this reason, their improvement follows modernization of elements of equipment based on use of the latest achievements in optics, chemistry, and electric and electronic technology. Such improvements may involve a reduction in the size and scale of lighting fixtures (with improvement in reliability and durability), provision of double (and triple where necessary) redundancy, introduction of objective control of the system's condition, and other improvements.

Speaking of on-board facilities, it is necessary to stress that practically the entire fleet of Aeroflot's mainline aircraft has been equipped with automatic control systems for approaches under Category I minimum conditions.

The on-board equipment ensures stabilization of the aircraft on the path assigned by the ground-based course and glideslope systems. The problem of landing under Category II minimum conditions also has been basically resolved--from the point of view of technical assurance.

The annual economic gain from introduction of landing systems in accordance with Categories I and II by 1985, according to forecasts, will reach nearly 40 million rubles. Unfortunately, a broader extension of flights under reduced weather minimums is being held back by the limited number of categorized airports. This is due to the need for greater material, labor and time expenditures for their re-equipment. Nevertheless, this task, which has a direct relationship to an increase in the economic efficiency of air transport, will be resolved.

At present, existing systems provide automation only for the landing approach, and the landing itself is performed manually as before. The NETs AUVU [Scientific Experimental Center for the Automation of Air Traffic Control], jointly with the developing enterprises, is now conducting tests with automatic landing systems on Il-62 and Tu-154 aircraft.

The units installed on board are distinguished from the Category II landing system by the computers for leveling off, as well as more improved means for monitoring and warning indications. This also is understandable: the probability of a successful automatic landing must be nearly 100 percent; hence the requirements for accuracy and reliability of the equipment are exceptionally high.

Flights under reduced weather minimums (including Category III) are being planned for all types of mainline aircraft in civil aviation and will be introduced in the coming years. Aircraft of the next generation will be equipped with reference piloting and navigation complexes, which will include means of electronic display and digital automatic landing systems which have indisputable advantages over the analog type.

The prospect for further development of automated landing facilities is linked with a shift from metric-wave band systems to the new landing system, which operates in the centrimetric-wave band. This will make it possible to eliminate the effect of weather conditions on air traffic scheduling to a significant extent and to substantially improve regularity when high flight safety is assured. The new system is free of the shortcomings inherent in its domestic and foreign forerunners which are now being used. Its advantages also include the capability of accommodating all types of aircraft (including VTOL and STOL aircraft), the formation of curved flightpaths in approaches as a means of increasing airport capacity, reduction of the distance between parallel runways and the creation of flexible vectoring patterns which contribute to reduction in the level of noise from approaching aircraft.

And one more important feature: the centrimetric-wave band system permits the creation of less expensive versions of equipment for airports on local air routes, including those with low air traffic density. Finally, with all its tactical advantages, it is significantly more economical than previous systems.

In addition, commissioning of the new system requires a definite time during which it must function simultaneously with the SP-70, SP-75 and SP-80. Of course, to achieve maximum effect this period should be shortened as much as possible. This is not such a simple task, if it is taken into account that it is unwise to discontinue use of equipment which has been put into series production long before its operating life is completed. On the other hand, it also is unwise to allow the duplication of installations of obsolete and new types.

Apparently, it is most expedient to divide the transition period into three stages. In the first stage, installation of equipment for the old system is continued, and at the same time the commissioning of the first models of the centrimetric-wave band equipment is begun. They are similar in use (one straight-in approach). In the second stage, the installation (but not the operation) of metric-wave band systems is discontinued. At airports which require an installation or replacement of obsolete landing facilities, the centrimetric-wave band system is set up. This also is done in those cases



when it is necessary to improve the operating characteristics. In the third stage, the new system supersedes the old one and is used under all possible conditions.

As far as lighting systems are concerned, when flights under Category III conditions are introduced, measures will be required to improve flight safety and to provide crews with additional visual data. This is necessitated by the low altitude (compared with Categories I and II) for decision-making, as well as the poor visibility in the touchdown, landing run and taxiing stages.

For an earlier transition to visual flight, an arrangement of approach lights along the centerline with intensification by a line of flashing lights is used. The strength of illumination and the angle of diffusion of the lights should preclude the possibility of loss of visual contact with the runway in case of inaccurate emergence on its centerline. Visual glidepath indicators are planned for greater clearness in the equipment. Many years' experience in operation in some countries has shown their effectiveness as a means enabling the pilot to establish and control the descent path throughout the glideslope.

Facilities to ensure the safe movement of aircraft and various means of transportation on airport territory under extremely limited visibility conditions also will be developed significantly. The most difficult task here is taxiing, inasmuch as the experience accumulated in our country and abroad in creating and operating taxiing systems is still inadequate. In addition, the simple installation of lighting facilities does not completely resolve the problem. Creation of an overall system for controlling and monitoring traffic about the airport, including airport surveillance radar, is needed.

Such problems must be resolved to ensure landings under reduced weather minimums. However, the safety and regularity of flights depend on takeoff minimums as well. In taking off under instrument conditions, crew errors are possible in incorrectly estimating the parameters of the takeoff run. As an example, an aircraft may not attain liftoff speed required by the end of the run because of incomplete brake release, low tire pressure, the presence of slush on the runway--and the pilot does not have information on all this. Moreover, at present there is no well-defined method of determining the conformity of the path taken by an aircraft in the takeoff run and the airspeed it gains. Often the crew, being overcautious, prefers to use more thrust than is needed for a normal takeoff.

In order to increase safety and adopt reduced takeoff thrust more widely, work is being conducted to create a special on-board system to monitor the takeoff run which determines the parameters of the aircraft's movement along the runway and provides data to make the correct decision on whether to continue or abort the takeoff run. In the future this information will be used in automatic takeoff systems. For reduction of takeoff minimums it is expedient to employ indicators on the cockpit windshield which make it possible to assess longitudinal and lateral movement, as well as to control it.

One of the extremely undesirable and even dangerous atmospheric manifestations in takeoffs and landings is wind shear. The complexity of the situation is aggravated by its suddenness; hence it means a delay in the crew's recognition of the causes of airspeed loss and in making a decision to counter the effect of the air mass on the aircraft. Work is being carried out to create on-board wind-shear warning devices. They will include on-board computers.

In a word, the research aimed at achieving automation for aircraft landings and takeoffs is proceeding at full speed and is making it possible to hope that the time is not far off when civil aviation will become completely all-weather.

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## CIVIL AVIATION

### LEGAL EXPERT EXPOUNDS ON NEW CIVIL AIR CODE

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 10, Oct 83 pp 18-19

[Article by N. Vasil'yev, candidate of juridical sciences: "The General Provisions"]

[Text] A series of announcements devoted to the new Air Code--the most important document in the country's system of air legislation--was inaugurated in the magazine's previous issue with the article by B. P. Bugayev, USSR minister of civil aviation, "The Air Code of the USSR--the Law of the Aviator's Life."

Today we continue the conversation. Readers' attention is called to an article commenting on the basic provisions of the first chapter of the Code.

A feature of the general provisions of a legislative document is that they formulate in concentrated form the basic standards of state and legal regulation of some form of public relationships and define the content of the remaining provisions of the law. The first chapter of the Air Code of 1983 provides the sum total of basic standards which regulate the legal airspace system and the procedure for aviation activity. In this case, reflecting the interests of our state in providing for flight safety and meeting the demands of the country's national economy and of Soviet citizens is of decisive importance.

During the years of Soviet rule these interests have remained fundamentally immutable. But the development of equipment and technology and improvement in the forms and methods of administration, as well as of legislative standards, have constantly entailed change in the general provisions of each one of the Air Codes of the USSR.

In the period following adoption of the previous Code (1961), substantial changes took place in our sector. Facts and figures convincingly attest to the fact that civil aviation has been turned into a highly developed, multi-purpose sector of the national economy. It is quite natural that the most

important functions of the sector--air transportation and carrying out operations in different sectors of the national economy--were pointed out in Article 4 of the General Provisions as the first order of priority. Other objectives also have been reflected in it, more precisely the purposes for utilizing civil aviation: medical assistance to the people and public health measures, the conduct of experimental and scientific research operations, and so forth.

The standards for the purposes for using civil aviation were formulated for the first time in the Air Code of 1935. This resulted from the beginning of active utilization of aircraft for air transport and for performing a number of other tasks. With certain changes they were transferred to the Code of 1961, in which the objective of special application of aviation in individual sectors of the national economy also was mentioned. These provisions also went into the Air Code of 1983. But in addition to more precise terminology, totally new objectives also have been reflected in it--the conduct of search and rescue operations, as well as the rendering of assistance in natural calamities, which is an important trend in civil aviation activity.

A detailed listing of these objectives is contained in the General Provisions also because of the need to clearly differentiate civil aviation from other forms of aviation, inasmuch as for them the fulfillment of the objectives cited is not typical of the principal function and exceeds the limits of the basic tasks. For this reason, when the standards of the Code are oriented toward "civil aviation," "civil aircraft," and "civil airports," the objectives of civil aviation established in the fourth chapter of the Air Code should be kept in mind.

The fifth article of the General Provisions says that the Ministry of Civil Aviation is the basic organ which has jurisdiction over the civil aircraft, as well as the airports and ground equipment, which belong to the state. Other ministries, state committees, departments and organizations possess such a right only with the authorization of the USSR Council of Ministers. The concentration of civil aviation assets basically in one ministry entails its right to issue standards documents relating to its competence, the limits of which have been clearly defined in the Provision on the Ministry of Civil Aviation. These same documents may be mandatory for other state organs, organizations and citizens as well. Such, for example, are the regulations on transport, the basic conditions and standard contracts for carrying out aviation operations, and the like.

Problems of the day-to-day activity of the sector are regulated by formal documents within the framework of the law [podzakonnyye akty]. All changes in the specific area of legal regulation of civil aviation activity are reflected in them operationally. The law does not possess such flexibility. For this reason, one of the most important matters resolved by the General Provisions of the Air Code is the clear differentiation between the area of legal regulation which is legislative and the area which is within the framework of the law. And if it is remembered that the number of standardized documents within the framework of the law is rather sizable, especially great attention should be given to this area.

In the previous issue of the magazine, an article by Minister of Civil Aviation B. P. Bugayev, in which the aims of important work related to adoption of the new Air Code were clearly defined, was published. In this important and crucial work, the inadmissibility of deviation from the legislative standards of the code which have a so-called immediate effect has to be remembered. At the same time, it is necessary to bring into conformity with the code, precisely and in detail, the documents adopted which have been related by the General Provisions to the competence of the Ministry of Civil Aviation. The importance of this work is increased, taking into account that the standardized documents issued by it, to a significant extent, go into the system of Soviet air legislation (in the broad sense of this concept, of course). And in order for the legislative system to function effectively, its various documents must be in accord with it as much as possible.

It is necessary to mention that the article in the Code of 1961 on the right and responsibility of the ministry to inspect all civil aviation of the USSR, regardless of its departmental affiliation, is absent in the current General Provisions (the standards of this article go back to the General Provisions of the Code of 1935). This does not mean, however, that the corresponding rights and responsibilities of the Ministry of Civil Aviation are being abrogated in the legislative procedure. The function of inspection is retained for the MGA [Ministry of Civil Aviation] in the Provision on it. But in the future (the legislator chose the correct path here, since the Air Code is a document of long-term effect), individual ministries and departments, obviously, will be able to resolve problems of inspection independently, and civil aviators will have an additional opportunity to concentrate their efforts even more on fulfillment of national economic tasks.

The code contains a substantial addition on "aviation personnel," that is, civil aviation workers whose activity is directly aimed at implementing its objectives. There is nothing analagous to this new term in the previous code, where the word "personnel" meant only "maintenance personnel" ["obsluzhivayushchiy personal"]. In scope of meaning, the term "aviation personnel" is close to the term "civil aviation specialists" being used in standardized documents. Because of its general nature it is applicable to all specialists, regardless of their relationships to aviation equipment and its maintenance. At the same time, the interests of flight safety and efficiency in implementing the tasks facing civil aviation dictate special requirements for persons whose activity is directly connected with transportation, aviation operations, and so forth. In accordance with the seventh article, such persons include flight personnel, maintenance personnel on board an aircraft, air traffic control personnel, and engineering and technical personnel engaged in the technical operation of aircraft.

In the Code of 1961, special requirements were established only in relation to flight personnel and the crew of an aircraft. In the new code they are being extended to include a broader group of persons who should know all its requirements, as well as other standardized documents. To a definite extent, the provisions of the Code of 1983 reflect practice which has developed and make it possible to define more precisely the group of persons subject to classification.

The new Air Code defines Aeroflot as civil aviation which is under the authority of the USSR Ministry of Civil Aviation. The 1961 law made it possible to group with Aeroflot the civil aviation of other ministries, state committees and departments, cooperatives and public organizations. The new definition removes this contradiction to practice which has developed.

In the international area, for example, Aeroflot has long appeared as an independent aviation enterprise representing the system of the Ministry of Civil Aviation. In practice, this aviation enterprise may be represented by different administrations which engage in international air transport. However, the Central Administration of International Air Communication, the relations of which with other territorial administrations presuppose additional measures of legal regulation, possesses the rights of a juridical person in this case.

It should also be stressed that Aeroflot (but not all the civil aviation in the country) has a single flag and emblem in conformity with the new Code. While on the basis of the Air Code of 1961 practically any aircraft in the USSR could make use of the distinctive markings of our sector, the markings which now should be on the aircraft of other ministries and departments have to be defined, apparently.

One of the most important features of our time is the ever-increasing use of the airspace for various purposes. Figuratively speaking, it is becoming more and more crowded in the air. And although individual standardized documents regulate the different types of activity in the air to one extent or another, there has not been a single standardized document establishing the overall principles for such activity. This concerns regulation to the extent that it affects the flights of aircraft. In accordance with the Code of 1983, the "Provision on the Use of Airspace in the USSR" should be such a document. It is being drafted as an addition to the Code and does not take the place of either the "Basic Rules for Flights in the Airspace of the USSR" or other standardized documents.

In the interests of covering a broader range of activity in the airspace of the USSR compared with the Code of 1961, the scope of the new law is being expanded to all aviation of the USSR and to foreign aviation within the USSR. However, in each specific case it is necessary to establish strictly the content of one standard or another. Individual standards of the Code contain precise instructions (see, as an example, Part 3 of Article 3) on the limits of their effect. The content of other standards may be established by means of additional clarification and interpretation. The provisions of the Code are applicable not only in the territory of the USSR, but also when civil aircraft of the USSR are outside our country if the laws of the country of stop-over do not require a different one.

Absent in the new Code is the instruction previously in effect that its action is not extended to aviation intended for experimental-design, experimental and research operations, and to aircraft of the aviation industry which are being tested, as well as to DOSAAF aviation. This directive lost its meaning with the existence in the USSR of a single airspace system, basic flight rules for



aircraft of all departments, a unified search and rescue system, air traffic control fundamentals, procedure for arrival in and departure from the country, and the like. It is another matter that many standards of the Code are applied only to civil aircraft, and the corresponding article of the second chapter does not relate to them those which exist in certain ministries, departments, and the DOSAAF.

The obsolete term "aeronautics" has been completely excluded from the Code. On the other hand, the term "aviation" has been given a broader interpretation. The innovation mentioned does not require obligatory rejection of the term "aeronautics" in standardized documents. It may be retained, for example, as the designation of one of the forms of aviation.

Overall standards for the airworthiness of aircraft and the suitability of airports and their equipment have been introduced in the legislative procedure for the first time. The standards are obligatory for all ministries, state committees, departments, enterprises, institutions and organizations dealing with aircraft, airports and their equipment.

I would like especially to draw attention to the definition of an aircraft in the 11th article. In conformity with it, an aircraft is considered to be a flight vehicle [letatel'nyy apparat] which is supported in the atmosphere by means of its interaction with air, as distinguished from interaction with air repelled from the ground surface. The purpose of the definition is to exclude space vehicles, rockets, air-cushion vehicles and the like from the effect of the Code. The legislation of other countries acts in the same way. From the point of view of transportation, possibly, such a definition is not completely satisfactory, since it lacks instructions on the transportation of persons and cargo, but from the position of flight regulation and observance of the air-space system it has been justified.

The appearance in the Code of the standard on the "national ownership" of an aircraft, which is determined by the state of its registration, is explained by the effect of the Chicago Convention, in which the USSR has been a participant since 1970. The need for this standard becomes apparent in cases of determining the state responsible for an aircraft.

It also is important to emphasize the fact that, in conformity with an article of the first Code, the airspace of the USSR was defined as a part of its territory. Although the airspace over the land and water territory of a state long has been generally recognized as part of state territory, national legislation does not always confirm this fact. At the same time, bilateral agreements on air communication, as a rule, follow this procedure.

This is not entirely a simple matter, of course. In particular, there is no single approach in international law to the question of the upper limit of state sovereignty. Meanwhile, a precise definition of such a limit is necessary and based on an international agreement.

As a whole, the General Provisions of the Air Code of the USSR of 1983 consolidate the key positions called upon to define the sense and content of other standards of the code and other standardized documents based on it. They provide a firm foundation for the system of standards not only of the Code itself, but of all Soviet air law (including the standardized documents of the MGA), and contribute to further improvement in the level of legal regulation of all aspects of the USSR's civil aviation activity.

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## CIVIL AVIATION

### IL'YUSHIN DESIGN BUREAU ACHIEVEMENTS PROFILED

Moscow GRAZHDANSKAYA AVIATSIYA in Russian No 10, Oct 83 pp 5-7

[Article by G. V. Novozhilov, general aircraft designer, twice Hero of Socialist Labor, and corresponding member of the USSR Academy of Sciences: "The Winged Generation of 'Il's'"]

[Text] Our design bureau was established 50 years ago. Sergey Vladimirovich Il'yushin was assigned to head it. Several brigades worked as part of the KB [design bureau]. One of them was under the direct supervision of S. V. Il'yushin.

The basic efforts of the designers were directed at solving a problem very important for the country's defense--the creation of a high-speed bomber. Work on it was completed with the acceptance of the highly effective DB-3 aircraft for the Air Forces of the Red Army, which marked the beginning of one of the Il'yushin collective's directions of creative activity. The flight and technical characteristics of the DB-3 bomber and its speed, load capacity and range were at the level of world achievements of the time and even exceeded them. This airplane and its subsequent modification, the DB-3F (Il-4) were the basic type of long-range bomber and torpedo bomber aircraft right up to the middle 1940's.

In the process of the work, the designing style of the collective headed by S. V. Il'yushin and his characteristic method of project planning, which rules out the striving to achieve the very highest values of separate technical indicators (for example, only the maximum speed, the longest range, or high load capacity) to the detriment of other features, was formed.

It may be stated that in creating the DB-3 and especially the Il-2 attack bomber, the first and highly successful attempt was made to apply the method of optimum project planning on the basis of the fundamental criterion--ensuring the maximum possible combat effectiveness for an aircraft corresponding to the level of aviation technology development of that time. This position has played a significant role in the success of Il'yushin aircraft.

The Il-2 became the initiator of a new form of air forces--ground attack aviation. It won fame for itself as a legendary aircraft. When the Il-2 was designed, the new ideas of S. V. Il'yushin, which consisted of the best combination of offensive and defensive means to make up a single combat system, were put into effect: the magnitudes of the armor and bombload, the firepower of the machinegun and cannon armament and protection of the aft hemisphere, the maneuverability, speed and range, and the invulnerability and combat survivability. In the course of resolving this extremely complex problem, the concept of including an armored framework in the stress diagram [v silovuyu skhemu] of the fuselage, which ensured the required strength with minimum weight outlays, was worked out for the first time. Double-camber armorplates were used to give the fuselage aerodynamic shape. S. T. Kishkin and A. N. Sklyarov, who conducted a number of tests, rendered great assistance in the process.

As a result of all the efforts, the Il-2 armored attack aircraft was built with AM-38F engines designed by A. A. Mikulin. The accuracy of destructive strikes against the enemy's accumulation of manpower, mobile equipment and fortified combat positions, and the ability to fly in any kind of weather and destroy targets at low level and in diving ensured exceptional combat effectiveness in its use. The aircraft's effectiveness was enhanced by its very high reliability and survivability.

In all, more than 41,000 ground attack aircraft (including the Il-10) were built--a record number in the history of world aviation. Historians refer to the Il-2, the "Katyusha," and the T-34 tank as the principal weapons which ensured our victory in the field in the Great Patriotic War.

The Il-10 attack aircraft was built in 1943. Retaining the same effective armor protection and offensive and defensive armament as the Il-2, the new aircraft was more maneuverable and significantly faster.

The Il-4, Il-2, Il-10, and later the aircraft which were stages in the history of Soviet aviation such as the Il-12, Il-14, Il-28 and Il-18, were developed at the initiative of S. V. Il'yushin. They were introduced into service at precisely the time that the aircraft was especially needed by the country. A continuous improvement in design, systems and hardware, which turned into a qualitatively new design solution after definite merits had been established, is traced in these aircraft. Thus, after the war the design bureau began work on the experimental Il-22 jet bomber--the first aircraft with engines in nacelles on pylons under the wings (this had been done long before the arrangement of attaching engines appeared in the United States). Important problems of jet aviation, the solution of which was necessary to develop the new technology at the time, were studied on the Il-22.

Utilizing the knowledge and experience accumulated, the collective created the first frontline jet bomber adopted in our country over a short period of time. Flight and handling characteristics were combined most favorably in the design of this aircraft: it was simple in handling and had good stability and maneuverability. A number of innovations which made it possible to reduce the

labor-intensiveness of manufacture and to improve the quality of riveting assembly operations were adopted in the design of the aircraft.

In 1943, when fierce battles were still under way on the fronts of the Great Patriotic War, the designers collective began at its own initiative to create a passenger aircraft to meet the requirements of the country's national economy predicted for the postwar period. They planned a new aircraft with 27 to 32 seats and a maximum range of up to 2,000 kilometers. In June 1947 the aircraft, called the Il-12, came out on the Aeroflot routes. For its time it had flight and technical data which were better than foreign aircraft of similar application and the domestic Li-2.

Creative evaluation of experience in operating the large fleet of Il-12 aircraft determined the appearance of the new Il-14 passenger aircraft, the flight tests of which were begun in 1950. Higher reliability was provided for in it, especially in connection with engine failure on takeoff, and it provided more passenger comfort. In addition, the latest navigation instruments and radio equipment at that time were installed in this aircraft. The Il-14 was produced in 15 versions, with the appropriate special equipment for each version. It proved itself to be an aircraft which was simple to handle and trouble-free.

The next aircraft, the Il-18 turboprop, belongs to the age of jet aviation. The designers collective was faced with the task of providing for the large scale of passenger transport by reducing the production cost of operation, that is, by making air transport accessible to the broad masses of working people. In addition, the new aircraft had to be able to compete on the world market in flight data, economy and comfort. The objectives that had been set were carried out: the IL-18 was designed, built and tested in record short times. The actual values of its flight and technical characteristics obtained during testing confirmed the planned data (incidentally, a characteristic of the designers collective is to strive for this).

The Il-18 was inspected in compliance with ICAO [International Civil Aviation Organization] standards and received an international airworthiness certificate. It became the first Soviet aircraft to be in wide demand in the world aviation market.

The Il-18 became the standard of economical efficiency, handling simplicity and comfort for Soviet civil aviation. This was achieved not only through research during the planning and construction of experimental aircraft, but also in the process of operation and as the result of improvements which increased profitability, comfort and flight safety.

Time passed, and demands grew for increased nonstop flight range. The collective, in working out the ideas of S. V. Il'yushin, was seeking new solutions when the long-range Il-62 was created. It was built with a configuration of four aft-mounted engines. Such an arrangement led to significant noise reduction and consequently increased the comfort. In addition, this made it possible to build an aerodynamically clean wing with efficient high-lift devices for the entire wingspan. A fundamentally new landing gear system with a retractable tail skid was developed; patents for it were obtained in many foreign

countries with a developed aircraft industry. For the most part, this landing gear arrangement has substantially reduced losses in the airframe structure, unavoidable when the engines are positioned on the aft part of the fuselage. In January 1963, the Il-62 made its first flight.

On foreign aircraft with the same engine configuration as the Il-62, the stability and controllability characteristics required at high angles of attack have been achieved by including complex hydraulic or electrical devices--so-called control wheel pushers [tolkateli shturvala]--in the aircraft control system, which has reduced the reliability of the control system and led to additional complications in operation.

The Il-62 was the first in domestic aviation to use engines with reverse thrust (which substantially increased the safety of landings and aborted takeoffs, especially on wet or icy runways), three-phase alternating current of stabilized frequency (which significantly reduced the number of systems and units and improved power supply reliability), a fuel system with pressurized compartments in the torsion box section of the wing (which significantly reduced the size of the system and the labor-intensiveness in its manufacture), and a high-pressure hydraulic system.

Further technical improvements were made in the Il-62M modification, on which they installed new D-30KU ducted-fan turboprop engines with a takeoff thrust of 11 tons each and relatively low fuel consumption. At the same time, the fuel supply was increased by 5,000 liters through the creation of a torsion-box tank in the vertical stabilizer, and the aerodynamic shape of engine nacelles and the fairing of the stabilizer and fin were improved. Lift dumpers (spoilers) began to be used not only in braking but in aileron operation. The design of the Il-62M control wheel was changed, the arrangement of instruments was made more convenient, and part of the navigation and radio equipment was replaced. The use on the engines of a more efficient reverser with outboard doors was a significant improvement. The operational range of the Il-62M was increased, and the landing approach speed was reduced. As a result, flight safety and economical efficiency in operation have been improved.

In July 1970, S. V. Il'yushin resigned as head of the enterprise because of serious illness. The aircraft which followed--the Il-76, Il-86, and modifications of these and earlier aircraft, were developed without Sergey Vladimirovich. But to this day the collective has been carefully retaining and developing the school which he founded and the traditions which have taken shape.

The Il-86, which had its first flight in 1976, has confirmed in practice all the characteristics planned and has received an airworthiness certificate. In December 1980, it entered into service and began passenger flights.

Creation of the multiseat wide-bodied aircraft was urgently necessary because of the increased number of passenger flights, the growing saturation of airspace, especially on routes with heavy passenger traffic, and the demand to reduce fuel consumption per unit of transportation.



The Il-86 is designed for 350 passengers, whom it can carry for a distance of 4,000 kilometers. Its maximum load capacity is 42 tons and its cruising speed at altitudes of 9,500 to 10,000 meters is 870 to 950 kilometers per hour. The aircraft is being operated from the most widely distributed airports in our country, from which Il-18, Tu-134 and Tu-154 aircraft take off.

Study of trends in the development of air transport determined the expediency of building an aircraft with such characteristics. Study of the operating conditions of the multiseat aircraft without the need to radically rebuild existing airports gave rise to an idea for transporting passengers' baggage, so-called "carry-on baggage" plus containers, used for the first time in the world on the Il-86 aircraft. This system has another merit. The wide range of the center-of-gravity positions provided by a number of design solutions has made it possible to permit the shipment of carry-on baggage without prior weighing. This simplifies the procedure of readying the aircraft for flight to an even greater extent.

In planning the Il-86, the traditional problems of reliability, safety and efficiency were resolved in a new way, which required the development and putting into use of a large number of innovations at the invention level. Because of this the Il-86 should serve as the basic model for development of a series of modifications.

The high efficiency of the Il-86 also results from a significant increase in flight productivity. Thus, its hourly productivity is 4.3 times higher than that of the first-generation aircraft and 2.3 times higher than that of the second-generation aircraft of roughly equal flight range. It is interesting to note that the fuel consumption per passenger-kilometer of the Il-86 and the Il-18 is practically the same, while the speed of the Il-86 is nearly 1.5 times greater.

The Il-76T transport aircraft, built in 1971, continues the development of one more direction in the creative activity of the OKB [Experimental Design Bureau] imeni S. V. Il'yushin. The history of the creation of civil cargo aircraft begins with the appropriate modifications of passenger aircraft with reciprocating engines. Thus transport and cargo modifications of the Il-12 and Il-14 were developed at first.

The IL-76T, designed for cargo shipments on medium- and long-distance air routes, belongs to a new generation of transport aircraft built to replace the turboprop aircraft of this type.

The high sweptback wing of the Il-76T has a high degree of mechanization in the form of slats and triple-slotted flaps. The tail assembly is T-configuration. Multiwheel landing gear, together with powerful high-lift devices in the wing and the aircraft's high power-to-weight ratio, enables the Il-76T to operate from unpaved airfields. The navigation instruments and radio equipment make it possible to fly on different air routes at any time of year and day and in different weather conditions.

The Il-76T aircraft carry different cargo: every kind of industrial goods, large-diameter pipe, buses, and agricultural, construction and other machinery. Wide utilization of all types of aircraft, ship and rail containers and pallets used in different countries of the world has been provided for. The cargo cabin has been equipped with mechanized devices for the loading and unloading processes, which substantially reduces parking time and increases operational efficiency. In planning the Il-76T, many technological innovations (for example, introduction of a large number of honeycombed structures) and innovations in the materials field were put into use. The problems of ensuring the necessary strength when a rather complex fuselage is of minimum size in accordance with the stress diagram [po silovoy skheme] also were serious.

Operation of the Il-76T was successfully assimilated on many domestic and international routes during the 10th Five-Year Plan.

In conclusion, one cannot help but speak of the role of the personality of S. V. Il'yushin in the history of aviation development. The labor of the aircraft designer is not simply free creativity, a flight of thought, based on the achievements of science and technology. Above all it is the ability to combine real design possibilities (in the broad sense of the word) with those tasks which are set in creating a new airplane and with the requirements of swiftly developing technology. Erudition, foresight, engineering inventiveness and intuition are necessary for this.

What has been said makes it possible to understand the greatness of the role of personality in the history of the development of technology, about which Academician A. I. Makarevskiy spoke well: "Our country knows the names of many general aircraft designers who have written glorious pages in the history of the development of aviation technology. And the name of Sergey Vladimirovich Il'yushin is especially meaningful among those names."

This fact also may serve as a clear expression of the recognition of the great talent of S. V. Il'yushin and the role of his creativity. Two nominations for an award were submitted to the Council of the Federation Aeronautique Internationale--from delegations of the United States and the USSR. However, when the president of the National Aeronautic Association found out that we propose to note the services of S. V. Il'yushin, he immediately withdrew his candidate. "I admire aircraft designer Il'yushin," he said, "and he deserves the Great Gold Medal first of all."

The services of Sergey Vladimirovich Il'yushin in creating new aircraft are recognized without reservation by all specialists in our country and abroad.

For the 50 years of its existence, the collective of the OKB imeni S. V. Il'yushin has followed a great and fruitful course. But the main thing, we believe, lies ahead. That is work on new, efficient, and more improved airplanes needed by our Motherland.

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## CIVIL AVIATION

### SIMPLIFIED, ECONOMICAL RAIL SHIPMENT OF KA-26 HELICOPTERS PROPOSED

Moscow VOZDUSHNYY TRANSPORT in Russian 18 Oct 83 p 2

[Rationalization proposal by engineers A. Kosteyev and S. Kizer: "To Repair on an Open Platform"]

[Text] Murmansk--The newspaper VOZDUSHNYY TRANSPORT has more than once addressed the problems of the efficient utilization of Ka-26 helicopters, including those related to their transportation for repair. There have been attempts to transport the Ka-26 by rail fully dismantled, packed in special containers at a cost of about 20,000 rubles each. At the plant they put the helicopters together again, and dismantled them again after the overhaul and a test flight in order to pack them for shipment, and the process of assembly was repeated at the enterprise again.

This has been extraordinarily expensive. Some aviation enterprises have ferried the Ka-26 to repair plants under its own power. Ours, the Murmansk enterprise, for example. In this case it took 40 hours for the trip! It is also unprofitable: high expenditure in fuel and the service life of helicopter units in short supply. And because of bad weather the crews at times had to remain in flight for a considerable time, to endure all kinds of inconvenience at our airports which fall to uninvited "guests"--and it is difficult with quarters, with refueling, technical maintenance, and food. And as a result of delay en route, the periods of time in the contract for delivery of the helicopter for repair have been broken.

We have proposed that the Ka-26 be shipped on open rail platforms, without dismantling the complex and delicate aircraft. We have made calculations, worked out the technology, and put together a manual. We have coordinated all our conclusions with the design bureau, repair plants, and with the department for oversized shipments of the Ministry of Railways.

And the first experiment was conducted this summer. Ka-26 helicopter No 24085 was shipped on an open platform from Murmansk to Vinnitsa. It traveled for 10 days over a route of more than 3,000 kilometers and was accepted by plant personnel without remarks. The technical justification and economic expediency of our proposal have been fully confirmed. The cost of the platform to the destination point was 731 rubles, a savings of 20 flying hours--more than 4,000 rubles under our conditions. Thus the economic gain from just one experimental shipment amounted to more than 3,500 rubles.

In finding out about this experiment, many enterprises, the Ufa and Alma-Ata enterprises, for example, have requested specifications. This problem worries many people. We have received much support in putting our proposal into effect from specialists at the Minsk aviation enterprise and from the GUERAT MGA [Main Administration for Operations and Repair of Aviation Technical Equipment, Ministry of Civil Aviation]. The appropriate directive has been prepared by our ministry.

Unfortunately, introduction of our rationalization proposal, with its obvious expediency, is being held up all the same. If anyone has any doubts, let him ask us firsthand for explanations.

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## CIVIL AVIATION

### BRIEFS

**YAKUTIA AIR SERVICE MEASURES**--The article by the First Secretary of the Nizhnekolymskii Party Raykom, Deputy of the Supreme Soviet of the Yakutian ASSR A. Chikachev, "The North Needs Wings" (IZVESTIYA No 240/241) has been carefully reviewed in the Ministry of Civil Aviation. According to the decree of the CPSU Central Committee and the USSR Council of Ministers of 7 February 1980 No 115 "On Measures for the Further Economic and Social Development of Northern Populated Regions," steps are being taken to further develop and improve airline service. However, there are difficulties in this. The demand for float-equipped Mi-2 and Mi-4 light helicopters and An-2 airplanes is not being met, since Mi-4 helicopters are being written off due to exhaustion of resources. An-2 floatplanes have already been written off and production of them recently ceased. The question of resuming float manufacture in the People's Republic of Poland is currently being decided. Two An-2 floatplanes from other Civil Aviation administrations are being earmarked for the Kolymo-Indigirsk Aviation Enterprise. In part, the ministry is taking steps to speed the introduction by industry of new An-28 airplanes. The An-28, which will replace the An-2, will begin testing at the end of 1983. The new An-3 airplane is scheduled to begin production in 1986. Construction of helicopter pads is planned for the settlement of Pokhodsk and Petushki. The editors were informed of this by S.I. Rodionov, Director of the Administration of the Use of Aviation in the Economy, Ministry of Civil Aviation. [Text] [Moscow IZVESTIYA in Russian 4 Oct 83 p 1] 12595

**AEROFLOT SERVICE TO UPPER VOLTA**--On 4 November an Aeroflot Tu-154 airplane left Moscow on the first regularly scheduled flight to Ouagadougou, capital of the Republic of Upper Volta. These flights were begun in accordance with an inter-governmental aviation agreement signed 2 April of this year between the USSR and Upper Volta. The route to the capital of this West African nation runs through Budapest, Tripoli, and finally, Bamako. Upper Volta became the 95th country to have regular Aeroflot service. Crews of the Central Administration of International Air Services, headed by V. Chuvatov and A. Demin, commanded the first flight. The plane arrived in the Upper Volta capital exactly on schedule, after traveling 6,500 kilometers. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 6 Nov 83 p 3] 12595

NEW TU-154M PASSENGER PLANE--In February of this year, in response to this newspaper's questions, chief designer A. A. Tupolev described a new airplane which will greatly improve passenger service. The TU-154M, as this modification of the well-known airliner is called, can fly passengers non-stop from Moscow to, say, Chita. Production of this new plane, which is anxiously being awaited in airports across the country, has been entrusted to the thrice-decorated collective of the Kuybyshev Aviation Plant. The collective is taking on this important task with honor. [Text] [Moscow TRUD in Russian 4 Dec 83 p 2] 12595

NEW AIR ROUTE--Helsinki--Aeroflot has begun a new route to Finland. Under an arrangement between Finnish tourist firms and Aeroflot, Soviet airliners will fly tourists directly from Helsinki to Sochi with a brief stopover in Leningrad. The new air route is one more step in the development of friendly, mutually beneficial relations between the two countries. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 11 Oct 83 p 3] 8936

IL-86 TRAINING--Training has begun in the Kazakh Administration of Civil Aviation to put the Il-86 passenger airliner into service. The first group of the best pilots, navigators and flight engineers recently left for Ul'yanovsk for retraining in the new aircraft. Yu. Yefremov, deputy commander of an aviation enterprise; F. Ayupov, deputy commander of a flight collective; aircraft commanders G. Voloboy and V. Sergiyenko; and others have received this honor. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 15 Oct 83 p 1] 8936

VNUKOVO RAMP RENOVATION--In accordance with the planning documentation of the "Aeroprojekt" institute, the Order of Lenin collective of the "Tsentrstroy" trust of the USSR Ministry of Transport Construction is completing renovation of the ramp at Vnukovo Airport. Its area will be increased by nearly 30,000 square meters. As airport chief A. Borisov reported, Vnukovo will receive three new parking positions for the wide-bodied Il-86 aircraft as a result of the expansion, and by a change in the ramp configuration, the parking area may be increased by another five or six aircraft. The construction workers have pledged to have the ramp in operation by the 60th anniversary of the October Revolution. [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 18 Oct 83 p 2] 8936

AN-26 WINTER ROUTES--With the arrival of winter, when the cold freezes the earth, the geography of the flights by the An-26 aircraft of the Yakutsk aviation enterprise is enlarged as the seasonal unpaved airfields are brought into use. On 18 November the first technical flight to the mountain airfield of Ulakhan was made by a crew commanded by V. Rukavishnikov with checkout officer G. From. Some 300 tons of oats, materials and equipment for the local farms are to be delivered to this mountainous region where, incidentally, the airfield was prepared by the efforts of a local sovkhos. The successful completion of the air freight work will facilitate implementation of the republic's Food Program which envisages the comprehensive development of reindeer breeding. In November AN-26 technical flights were also made to several rayon centers and settlements in the republic--Churapcha, Kzyl-Syr, and Amga. Reliable communications have now been established with these populated points and all freight, in particular dozens of tons of apples, meat and other produce, is being delivered without loss and without transshipment at intermediate airports. [By O. Borodin] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 24 Nov 83 p 1] 9642



NEW AN-72 RECORD--The famous test pilot Marina Popovich has set two new world records. Along with test pilot Sergey Maksimov and flight engineer Tamara Medvedova she was at the controls of an AN-72 turbojet (takeoff weight 20-25 tons) when it reached the maximum altitude ever recorded for this type of aircraft--13,410 meters, and an altitude of 12,980 meters in straight and level flight. [Excerpt] [Moscow KOMSOMOL'SKAYA PRAVDA in Russian 17 Nov 83 p 4] 9642

SHEREMET'YEVO FREIGHT HANDLING--On 20 October a ceremony at the the capital's Sheremet'yevo-2 international airport was dedicated to the laying of the foundation stone for yet another airport building--an up-to-date automated complex capable of receiving and processing 150,000 tons of containers, boxes, packages and all other kinds of freight each year. The building is more than one-fourth of a kilometer long and four stories high. The "Aeroprojekt" institute participated in work on the technical problem and documentation. From May 1985, the scheduled date for the completion of construction, the flow of freight arriving in Moscow and being sent abroad by air will pass through this warehouse. Its shell will be made from reinforced concrete and metal structures, while special triple-layered panels covered with a tough gold and brown paint will reliably protect the internal premises from rain, snow and temperaure variations in the outside air. From floor to ceiling the inside will be covered with small-scale mechanization facilities, self-propelled lifting devices, conveyers and stackers. Even the 12-ton containers will placed in position or loaded into cargo aircraft in only minutes. An electronic "warehouseman"--a high-speed computer--will help to find the required freight. [By V. Belikov] [Text] [Moscow IZVESTIYA in Russian 21 Oct 83 p 3] 9642

LASER DETECTS GAS--As is known, in the Crimea there are no holidays for the aircraft of the Administration for the Use of Aircraft in the National Economy. And the crew of the Mi-8 helicopter commanded by Ivan Gubarev has an unusual mission and the helicoper is loaded with unusual equipment: it has on board a series produced laser installation. On orders from the Ukrainian SSR Academy of Sciences Institute of Botany and the Institute of Plant Physiology the airmen are conducting long-term tests to study the agrochemical characteristics of the fields and vineyards of the Crimea. A laser on a helicopter is something new for the Administration for the Use of Aircraft in the National Economy. But it has a great future: it is proposed to use lasers to determine the location of gas leaks on gas pipelines, conduct survey work for minerals, environmental protection and so forth. [By L. Mikhaylov] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 12 Nov 83 p 1] 9642

NEW TU-154 ROUTE--The Tu-154 airliner recently landed for the first time at Zaporozhye airport. The technical flight was made by the crew of commander V. Timokhin from Borispol. The event was preceded by much preparatory work by all the operations and maintenance services at the airport, many sections

of the Ukrainian Administration of Civil Aviation, and local party and soviet organs. The runway was reconstructed and airport equipment was updated, and the special transport service received new equipment and specialists from many of the services underwent training. A commission led by chief of the Ukrainian Administration of Civil Aviation A. Goryashko concluded that the Zaporozhye airport is ready to provide support for regular flights by aircraft of this type. The Tu-154 can now land at yet another major industrial center of the Dnepr region. [By P. Protsenko] [Text] [Moscow VOZDUSHNYY TRANSPORT in Russian 17 Nov 83 p 1] 9642

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## MOTOR VEHICLES AND HIGHWAYS

### VPO CHIEF ON FUTURE OF SERVICING, SPARE PARTS SUPPLY FOR PRIVATE VEHICLES

Moscow ZA RULEM in Russian No 4, Apr 82 p 2

[Discussion with N. V. Sladkovskiy, chief of the All-Union "Soyuzavtotekhnobsluzhivaniye" Industrial Association of the USSR Ministry of the Automotive Industry conducted by the ZA RULEM editorial staff: "Vehicle Servicing and Spare Parts"]

[Text] /The question concerns a comparatively young service branch for the population in our country and one which today, without exaggeration, infringes upon the interests of millions of people. How it develops farther from this point depends to a large extent on the durability of vehicles being created through the labor of motor vehicle builders, the comfort and attitude of those who are using them, and safety on our roads. In the end here is a complex combination of questions exceeding the limits of technology and production. The extent to which serious importance is attached to them is witnessed by the fact that recently the Politburo of the CPSU Central Committee among other national-economic tasks considered proposals concerning measures to further develop the network of enterprises for technical maintenance of passenger cars belonging to citizens and to increase the output capacities of spare parts for them./ [in boldface]

/What is the content of these measures and how will vehicle servicing be developed and the problem of spare parts be resolved? The editorial staff asked N. V. Sladkovskiy, chief of the All-Union "Soyuzavtotekhnobsluzhivaniye" Industrial Association of the USSR Ministry of the Automotive Industry to answer these questions./ [in boldface]

"Annually the inhabitants in our country acquire nearly a million passenger cars and the fleet of personal vehicles already numbers about 10 million. This means that 10 million of their owners along with 30 to 40 million members of their families are using vehicles and are concerned with caring for them. A vehicle maintenance system was called for to help them in this, and the formation of which, in fact, began simultaneously with the mass production of passenger cars in the country, that is, a little more than 10 years ago. The state allocated

considerable funds for constructing and equipping large and small stations all over the country. Now the vehicle maintenance system already has a considerable production capacity at its disposal. This is about 2000 enterprises, shops and workshops, including 1300 large ones of which many were built in accordance with current plans. Now more than 100,000 people are engaged in vehicle servicing and it is capable of serving a considerable part of the personal vehicles. However, according to the rates of development of the production and technical base, vehicle servicing still lags behind the growth of the vehicle fleet. It is also necessary to take into account that in 1985 their average age will reach nearly 8 years, and that is why an ever-increasing number of vehicles will require major repair and painting."

"In order to improve the situation, it was decided to complete construction in 1984-1985 of 5 specialized vehicle centers and 22 stations. In addition, with a view towards expediting the putting of new vehicle servicing capacities in operation, it was decided to purchase in the 1983-1987 period more than 300 fully equipped 4-position and 15-position STO [technical servicing stations] from European countries--CEMA members. In this year already we will receive 46 of them and 108 more in 1984 and 1985."

"The construction of new STO's requires considerable capital investments, and the allocation of which at the present time is associated with certain difficulties. Therefore it was decided within the next few years to construct the STO's in the broadest manner through a method of operations using an organization's own resources (beyond the limits of state capital investments), and for which special credits will be given on more favorable terms than before."

"In addition, it was recommended to transfer unused and uninhabited buildings for organizing STO's in them to the balance sheet of vehicle servicing industrial associations (regardless of subordination). As you see, a full combination of measures is being taken for developing the production and technical base of the vehicle servicing system."

/At the present time vehicle technical servicing enterprises comprising this system belong to various departments. What are its structure and prospects?/  
[in boldface]

"Prior to 1976, vehicle servicing enterprises in various republics were subordinate to councils of ministers, ministries of motor transport or ministries of consumer services, and gorispolkom's. This year the All-Union Industrial Association 'Soyuzavtotekhnobsluzhivaniye' was created in the USSR Ministry of the Automotive Industry and to which the enterprises of some of them were transferred. Now a network of vehicle servicing enterprises of 11 union republics is included in it. Vehicle servicing in the RSFSR still remains subordinate to the ministry of Motor Transport--both to its industrial association 'Rosavtotekhnobsluzhivaniye' and to individual kray and oblast transportation administrations; in Uzbekistan, Latvia and Estonia to the ministries of consumer services, and in Moscow to the Mosgorispolkom. In addition, a network of plant stations of the "AvtoVAZtekhnobsluzhivaniye' Industrial Association, as well as of the AZLK [Moscow Automobile Plant imeni Leninist Komsomol], ZAZ [Zaporozhe Automobile Plant] and GAZ [Gorkiy Automobile Plant] systems of the USSR Ministry of the Automotive Industry is operating all over the country."

"'Soyuzavtotekhnobsluzhivaniye' and 'AvtoVAZtekhnobsluzhivaniye' (nearly 65 percent of all capacities of the vehicle servicing system in the country and 70 percent of the volume of operations) have the greatest capacities at their disposal. Centralization of this kind makes it possible to coordinate the activities of STO's to determine more correctly the equipment, materials and spare parts between them; and, finally, to objectively select a construction site. As regards installation of the new STO's about which I spoke, they will supplement the enterprise system of the Ministry of the Automotive Industry as well."

"Where vehicle servicing continues to remain subordinate to republic organizations, they will be responsible for its development as before."

/In recent years it has become more difficult than before to obtain some spare parts for vehicles. How will this problem be resolved?/ [in boldface]

For reasons which have already been named, the consumption of spare parts is growing rapidly. Plants and manufacturers are increasing their output, but their resources are not infinite. Therefore it was decided to make up the deficiency mainly by means of restoring worn out parts, units and hardware. Today we remove them from a vehicle and discard them even because of a slight defect or wear. This is not economical. In fact, after restoration they can still work, and sometimes no worse than new ones, but moreover they will be cheaper. In this case, the delivery agent will receive a certain sum (a list and prices of worn out parts being accepted will be published at all STO's) for old parts."

"The production process for restoring them is not a simple one--parts such as crankshafts and camshafts and a cylinder block must have high precision of dimensions and surface finish. Special equipment is required for this and leading machine-building plants of the country received the task for its manufacture. Enterprises of the ministries of the petroleum refining and petrochemical industry, chemical industry, and timber, pulp and paper, and wood processing industry will stand to supply new packings, stuffing boxes, seals and the like necessary for assembling the restored units and hardware."

"It is also possible to reduce the scarcity of some spare parts through other means, and for this it is necessary to assimilate them in diverse specialization enterprises as public consumption goods, but after having determined demand and planned production of course."

"All these measures will make it possible to essentially correct the situation regarding spare parts, but, of course, they will take time."

/For various reasons many car lovers do not want to part with old vehicles that have served them well. Will spare parts be produced for those that are removed from production?/ [in boldface]

"The manufacture of spare parts of that kind is extremely burdensome and unprofitable for plants. In fact, it is necessary to restore the spent outfitting, adjust the manufacturing process, and wedge into the working production lines. However also, this category of vehicles has not been abandoned without attention. And so that the work was justified, the matter was examined regarding raising prices for spare parts of this kind, as this is accepted in world practice."

/The growing social and economic significance of vehicle servicing along with an increase in the volume of services requires improving their quality and efficiency in serving the population. What is being done in this direction?/  
[in boldface]

"We know that car lovers frequently remain dissatisfied with vehicle servicing. It's true that there are STO's which do not have complaints, but just the gratitude of customers. This shows that it's possible to operate also in our organizationally and technically complex services as life requires."

"Having proved itself well at some enterprises of 'Soyuzavtotekhhobsluzhivaniye', 'AvtoVAZtekhobsluzhivaniye' and in a number of republics, lately a full system for managing the quality of services is being incorporated more broadly."

"However, any system, no matter how perfect it may be, will not provide positive results if the STO workers don't strive for it. And, unfortunately, they aren't concerned with the matter everywhere as prescribed. Sometimes there is a lack of knowledge and skill, and at times simply conscientiousness too. The fact of the matter is that during the period of wide-spread construction of STO's the labor force didn't have enough skilled specialists to complete them in every detail, and therefore random people got in the collectives, and who, using the growing demand for services, were only out for money. The vehicle servicing formed during those years of its unflattering reputation is also incumbent upon them. Now the situation is changing. Young people trained in our special PTU [vocational and technical schools] are coming to vehicle servicing, those who arrived earlier are raising their qualifications, and much educational work is being conducted in the collectives. Labor discipline is being strengthened. The general organization of full brigades at the STO's is promoting this. As our experience shows, where they are operating discipline is also high, and quality is everyone's responsibility."

Now, when the operating routine of enterprises and organizations engaged in serving the population is being put in good order in the country, the most convenient operating schedule for local car lovers is being established at all STO's. In addition, we are striving to reduce the time spent by customers in filling out the order and receiving the finished vehicle."

"There is every reason to believe that within the next few years, thanks to overall efforts, vehicle servicing will become the way the car lover wants to see it."

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## MOTOR VEHICLES AND HIGHWAYS

### TARTU EXPERIMENTAL WORKS PRODUCES SPECIAL-PURPOSE LIGHT TRUCKS

Moscow PRAVDA in Russian 9 Oct 83 p 2

[Article by D. Klenskiy, PRAVDA correspondent in Tartu, Estonian SSR: "A Van Vehicle on Order"]

[Text] An experimental plant for repairing motor vehicles in the city of Tartu has manufactured the first three copies of a new van vehicle. One of them was sent to Moscow for practice trials. The main advantage of the novelty over other trucks of this type is that its doors open on three sides. This is extremely convenient for loading and unloading operations, maneuvering at piers and goods receiving points at stores and warehouses.

The scheduled design of the van vehicle was developed by designers of the Estonian SSR Ministry of Motor Transport and Highways. An experimental team headed by M. Must participated in creating the novelty. Designers V. Sirel' and A. Zakharov and process engineer A. Kuper'yanov are included in it.

The Tartu enterprise is recognized as the leading one in the country for designing and producing special van vehicles. Twenty years ago on an order from the "Mosfil'm" studio the repair workers sent a vehicle adapted for transporting movie cameras for taking wide-angle pictures. Later they had to satisfy the requirements of flower shops and they made a van vehicle so that tender produce would not suffer enroute. Among the customers were both sportsmen, medics and field communications personnel.

In recent years the collective has been creating more and more vehicles for the rural area. Among them are a general-purpose van vehicle for personal services and the delivery of cooking products, bread and rolls. Each vehicle of this kind is equipped with a hydraulic lift.

"But, perhaps, the van vehicles delivering milk from the farms to the receiving points are considered the most popular in the countryside today," relates plant director S. Piybar. "The fact of the matter is that in Estonia a fourth of the milk being produced is necessary for the personal households of the rural people. Enterprises took upon themselves the delivery of valuable products to combines along special circular routes. The Tartu van vehicles are used for this. They are equipped with two 1000-liter tanks and a half-ton skimmed milk container which is provided in exchange for the milk.

## MOTOR VEHICLES AND HIGHWAYS

### DELAYS IN BAM ZONE ROAD BUILDING CITED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Oct 83 p 1

[Article by I. Shibanov, brigade leader of Sredne-Amgun timber management in the settlement of Berezovyy in Khabarovsk Kray, "Potholes in the High Road"]

[Text] Are roads being built rapidly in Siberia? If one judges by BAM [Baykal-Amur Main Railroad], then yes. Thousands of kilometers of railway have been laid here during the last 10 years, and trains have traveled in the west, the east and in the center of the main railroad. Dozens of settlements and whole towns sprang up beside it. Everything is being done so that the country expands the economic development of new territories a little more rapidly. And at a hot point of this zone--in Khabarovsk Kray--in our country, two ministries (the USSR Ministry of Construction of Heavy Industry Enterprises and the Ministry of Construction in the Far East and Transbaykal Regions) up to now were not able to cope with the road, the planned length of which is 47 kilometers.

Why must we talk about this? Indeed because year by year we timber purchasing agents are compelled to go farther and farther out into the taiga to provide necessary timber for the country. The most productive and accessible forests of the inhabited regions of the Far East are fairly exhausted. New prospects for the industry are connected with the virgin taiga riches of the Baykal-Amur main railroad.

Our Sredne-Amgun timber management is just operating here too. The base settlement of Berezovyy, one might say, is stuck to the main railroad. The rails reliably connected us with the large timber processing centers--Komsomolsk-na-Amure and Amursk. And the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry developed construction of an even more powerful timber industry--Tuguro--in Berezovyy. And now the first section of it was put in operation at 100,000 cubic meters of timber haulage annually. Consequently, the production flow of the forest cutting area will only increase. Many more logging trucks will begin to tamp down our road from the settlement to the taiga sections. In due course, the largest center of the industry will be formed here.

But stop. I fell into my reverie at the wrong time: the bus in which we are going to work begins to shake and bump in the potholes. It draws closer to the side of the road since the main part of the road is impassable. It clammers round the bridges across the taiga rivulets since it can't get to the bridges.

Finally, it gets stuck in the mud. And we observe with sympathy as the drivers of logging trucks loaded with their "binding" languish on the road. And one no longer thinks about the optimistic prospect, but about the fact that this road which is called upon to provide the development of timber procurements in our interior has one foot in the grave.

But, in fact, everything should have been otherwise. The Tuguro high-speed highway for cargo assembly--abbreviated as Tuguro AGSM--was planned in advance. Its construction on the order of the Ministry of the Timber, Pulp and Paper, and Wood Processing Industry began on schedule. While relieving each other, such powerful organizations as construction trust number six and construction trust number eight of the Main Administration for the Construction of Industrial Establishments in the Regions of the Far East took a hand in it. Then the administration of the Ministry of Construction in the Far East and Transbaykal Regions joined the competition. And this epic has been dragging on since 1974.

During the 10 years, hardly 25 kilometers has been put in operation. A gravel upper surface was never done on the remaining ones. From the outset of the five-year plan, bridge detachment 26 of the subcontract trust constructed bridges, it's true, but without approaches to them. And this year the general contractor also didn't acquire a ruble from the allocated capital investments for seven months.

I dare say that the volume of operations remaining on the Tuguro AGSM is an annoying trifle for the Ministry of Construction in the Far East and Transbaykal Regions. But because of this "trifle" the timber shipment rates are being held back, and the logging trucks often simply overturn on the sharp detours. We risk in vain the health of people, waste fuel for nothing, and damage the rubber.

"It isn't the vehicle, but the roads that transport the timber in our country," N. Makarov, senior driver and timber brigade leader, says with bitterness.

I agree with him. Our veterans really know how roadways that become soft can paralyze the operation of organizations and ruin the implementation of planned tasks.

Won't red tape cost the state a pretty penny in the completion phase of the road?

9889

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## MOTOR VEHICLES AND HIGHWAYS

### GAZ WORKS TO PRODUCE NEW SERIES OF AGRICULTURAL TRUCKS

Moscow IZVESTIYA in Russian 23 Sep 83 p 2

[Article by N. Pugin, general director of the "Gorkiy Avtomobil'nyy Zavod" industrial association: "A Trailer Truck for the Rural Area Is To Be a New Family of Economically Sound and Highly Efficient Motor Vehicles With the 'GAZ' Trademark"]

[Text] During its history of half a century, the Gorkiy automotive plant has given the country over 100 models and modifications of vehicles for the most diverse purposes. Among them are vehicles of comparatively small weight and sizes that have (of particular importance) maneuverability on roads of all kinds, including dirt, and this is exactly what's needed for a rural area. It's not without purpose that seven-tenths of the current agricultural motor pool in the country is equipped with vehicles bearing the Gorkiy trademark. In addition, the chassis of our motor vehicles are being used for producing fertilizer spreaders, milk trucks, and mobile workshops.

However, as it was stated in the CPSU Central Committee and USSR Council of Ministers resolution "on measures for expediting scientific and technical progress in our national economy," it is necessary to provide for output of products which by their own indicators meet the best contemporary models and substantially increase labor productivity. It's impossible to comply with the demands of agriculture just by virtue of modernizing vehicles already being produced. The motor vehicle builders realize this. A rural area doesn't simply need transportation facilities, but equipment specially intended for operating under the conditions of agricultural production.

That's why a new fourth generation of trucks is being created in the "GAZ" association for work in the rural area. The design has already been worked out for the 9-ton "GAZ-6008" dump trailer truck. What requirements will the new model meet?

First and foremost, it has increased maneuverability. The possibility was envisaged of operating the vehicle in conjunction with harvesting equipment in fields. In "joining" them with grain and silage harvesters, these trucks will be able to move across a field with a speed of two to three kilometers per hour. It is of no small importance that they will be equipped with bodies that tip on three sides. This will reduce labor costs during unloading. The vehicle's



six-cylinder, air-cooled diesel engine will provide fuel economy, and in this case the emission of toxic gases into the atmosphere will be reduced. In comparison with liquid-cooled engines, the new diesel is more adaptable for work in the country's various climatic zones. According to the calculations of economists, using the trailer trucks will allow a savings up to 370,000 tons of fuel annually and will reduce the requirement for drivers by one-half. The economic effect of one trailer truck is more than 3,000 rubles per year.

The association is conducting development of new trailer trucks and diesel engines jointly with collectives of the Saransk dump truck plant, the Balashov design bureau for trailers, the Yaroslavl plant for fuel equipment, as well as a number of industry and union NII [scientific research institutes]. Design of the trailer truck, which was performed in accordance with technical requirements of the USSR Ministry of Agriculture and Goskomsel'khoshtekhnika [State Committee for Agricultural Equipment], provides for a rapid resetting of the bodies for transporting various cargoes.

The creators of the new trailer truck are also concerned about the comforts of the drivers: comfort conditions inside the vehicle are almost the same as in medium class passenger cars. The steering has been made easier and the truck's smoothness of travel along various roads is provided for.

There are two ways of organizing production of diesel trailer trucks: building a new plant or radical renovation of our head enterprise and its branches. We chose the second way as the more efficient, although it's also highly complex. In fact, renovation will have to be conducted under the conditions of operating production and without actually reducing the output of products. This will be the largest modernization during the automotive plant's history of half a century. In particular, we are faced with constructing a new building wing for diesel power machine units, axles, drive shafts, nonferrous casting and die forging. Of course, a considerable amount of resources are needed for all this. However, the construction of a new plant would be five times more expensive.

Considering the large load of urban construction organizations, the USSR Ministry of the Automotive Industry is assisting the automotive plant in strengthening its own construction base. We plan to perform approximately 40 percent of all operations using the organization's own resources. At the same time, the construction trust of the association is already in full swing in constructing a shop for drive shafts and a number of other projects. As regards the basic contracting construction organization, "Avtozavodstroy" trust, in our opinion it should have concentrated efforts precisely on automotive plant projects and reduced the volume of operations to 32-33 million rubles per year. In fact, at one time this trust was also created especially for developing the automotive plant, but in recent years it has been conducting numerous other projects.

Of course, renovation isn't done without difficulties. Thus, within the next few years, we are faced with tearing down many of the obsolete dwellings in preparing the area for a new building wing for the diesel units and nonferrous casting. The ispolkom of the Gorkiy city soviet is rendering assistance in vacating the space. A decision was made concerning the fact that beginning next year up to 20,000 square meters of dwellings must be put in operation

annually in addition to the earlier established plans. Enterprises of the USSR Ministry of Construction are enlisted in implementing these tasks.

The decree for expediting scientific and technical progress orients us towards introducing in the course of renovation, of modern means of mechanization, robotic engineering complexes, and computer technology. And this is an inevitable process so long as we have to assimilate the production of diesel trailer trucks without a substantial increase in the number of workers. Of course, the assistance of many enterprises and organizations in the country is needed. The Moscow special design bureau for automatic lines and special machine tools proposed the creation of fully automatic equipment for machining crankshafts and camshafts, pistons, cylinders and other components. The Voronezh association of heavy mechanical presses must furnish the automatic lines for stamping such large components as a crankshaft, front axle and driven pinion. We're manufacturing a considerable portion of the machine tool equipment ourselves at the automotive plant.

Measures are being taken at the same time for further development of the experimental base and experimental production. Modern testing and diagnostic equipment was acquired for this. Experimental production was organized in the new building wing for producing small series diesel trailer trucks, and where equipment with ChPU [computer numerical control] is concentrated.

We are transferring as well a portion of planned operations to automation calculating on the fact that all this will help to expedite fine finishing of assemblies and the vehicle as a whole and incorporate a more modern manufacturing method.

At the same time, creation of an automated complex for planning bodies and manufacturing body dies remains an acute problem for us. Unfortunately, equipment being produced by the Ministry of the Machine Tool and Tool Building Industry and the Ministry of Instrument Making, Automation Equipment, and Control Systems is unsuitable for this purpose. We are counting on assistance from USSR Gosplan in solving this task.

The output of diesel trailer trucks will require the further expansion and cooperation of production. Participating in the deliveries will be 14 ministries and departments with whom the products list of assemblies, components and materials essentially was coordinated. Thus the USSR Ministry of the Petroleum Refining and Petrochemical Industry began producing more than 300 kinds of industrial rubber products. Enterprises of the USSR Ministry of the Automotive Industry will provide over 250 kinds of components to the Gorkiy workers.

Striving to maintain efficient contractual discipline during such broad cooperation is an extremely complex task. For example, we're no longer satisfied with the design and quality of tires. The technical and economic indicators of motor vehicles are being reduced because of their imperfection. This equally concerns both new models of our vehicles and those being produced today. Another urgent problem is the shortage of high-grade lubricating materials upon which the extended service life of operating individual assemblies and the vehicle as a whole depends to a large extent.

As we see, the tasks of assimilating production of new vehicles for the rural area far exceed the limits of the association and even the Ministry of the Automotive Industry. The question concerns the combined long-term efforts of many sectors of the national economy. That's why in resolving all problems we consider it necessary to include renovation of the Gorkiy automotive plant and its branches on the list of especially important construction projects. This needs to be done with full allocation of capital investments. In the 12th Five-Year Plan, it is necessary as well for specific purposes to provide the automotive plant with automatic lines and special equipment of native production and from CEMA member countries.

The transition of the Gorkiy automotive plant to the production of diesel trailer trucks for the rural area is a national economic task. Its solution will make it possible to contribute heavily towards implementing the USSR food program.

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## MARITIME AND RIVER FLEETS

### RIVER FLEET OFFICIAL ON PLANNED IMPROVEMENTS IN SHIPBUILDING

Moscow RECHNOY TRANSPORT in Russian No 9, Sep 83 pp 2-3

[Article by V. Tikhonov, technical administration chief of the MRF [Ministry of the River Fleet]: "Scheduled Tasks of Shipbuilding"]

[Text] Relying on the achievements of scientific and technical progress, workers of the planning and design and scientific research organizations of the Ministry of the River Fleet laid a strong foundation for creating modern ships that meet the progressive trends in developing the river fleet. A considerable portion of the ships being planned for delivery in the current five-year plan and projected for construction in subsequent years must have increased durability of hulls and deck plankings, which create the possibility of using more powerful devices for transshipping operations and allowing navigation in broken ice. They must be equipped with units for mechanizing and automating shipborne operations and preventing pollution of the environment.

The construction of specialized ships is the most important trend for improving the river fleet and increasing its efficiency. A shortage of them restrains the assimilation of new freight flows and restricts the activities of river transportation, since the shipment of some cargoes, including those which must be switched from railroads, is possible only in specialized ships.

In coming years, it is envisaged to supplement shipping lines with motor ships for transporting vegetables, motor vehicles and containers, as well as heavy cargoes up to 1,000 tons, and with refrigerator ships and other specialized ships of native and foreign construction.

The Volgograd and Rybinsk plants build vegetable-carrying ships, shipyards of the GDR build refrigerator and container-carrying ships with a carrying capacity of 1,000 tons, and enterprises of the Ministry of the River Fleet build ships for transporting heavy cargoes.

Shipments in large cargo configurations, to which more than half of the freight turnover now being performed today by the nonself-propelled fleet falls, will receive further development.

In the 11th Five-Year Plan, the construction of pusher tugs and nonself-propelled cargo ships is being carried out with regard to maximum development of cargo shipments in the nonself-propelled fleet.



The number of barges and sections being delivered is increasing 1.3-fold. Bulk cargo sectional structures with a carrying capacity of 8,650 to 9,000 tons and oil tanker barges with a 6,000-ton capacity are being constructed in accordance with new plans. The dimensions of these ships allow more efficient utilization of ship passage installations on the Volga and the Don.

The eastern basins are being supplemented with barges from plan 16801 with a cargo capacity of 3,000 tons and from plans R56 and R29 with a cargo capacity of 2,800 to 3,000 tons. In the near future, we will be faced with changing to new plans and increasing the cargo capacity of barges up to 3,500-4,000 tons. In this case, a series of oil tanker barges must be produced for Western Siberia on the basis of a new bulk cargo barge.

The small river fleet will be supplemented with unified barge platforms (plan R146A) with a cargo capacity of 80 to 130 tons and a draught of 0.6 to 1 meter. Series construction of them has begun at the Petrozavodsk SSRZ [shipyard]. The use of ramps placed together on barges makes it possible to unload motor vehicles, tractors and other self-propelled equipment "under their own power" and to use them on rivers where there are no berths and crane equipment.

At the present time, a series of standard size barges with a cargo capacity of 200-500 tons and 600-1,000 tons is being created from module sections for construction at enterprises of the Ministry of the River Fleet.

The tugboat fleet will be supplemented with intermediate-power and stepped-up power pusher tugs. Several domestic plants are implementing construction of intermediate-power ships such as these. Deliveries will continue of OT-2000 type pusher tugs from the Hungarian People's Republic, and in this case the ship's power capacity was increased to 1,765 kilowatts (2,400 horsepower).

Operations are under way for transferring tugboats and pusher tugs of the new plan to construction in exchange for ships of the OTA-800, "Bor" and other types. It is necessary for industrial enterprises of the Ministry of the River Fleet through higher rates to expand construction of the low-power pusher tugs of plans R162 and 81170 in place of ships of obsolete plans R96, R33, R14 and others.

The cargo transportation fleet is obtaining further development. Trials of the composite motor ship "XXVI S"yezd KPSS" with a cargo capacity of 10,000 tons, and which became operational in 1981, showed that the crew's labor productivity is 35 to 40 percent higher, and the cost of shipping is 25 percent lower than for a motor ship of plan 507B.

In addition, a number of technical defects showed up during acceptance trials which the Navashino plant had not eliminated up to now, and it continues to produce the ships in fulfillment of a previous order. Thus mooring equipment in the stern of the leading section and a ballast pump will be installed beginning only with the 13th ship. Decisions are not being implemented for increasing output of the shipborne power station and improving the layout of the engine compartment.

Organizing the transportation service of the agroindustrial complex has particular importance. By 1985, Russia's river transportation workers must increase the volume of vegetable and melon crop shipments by a factor of more than two-

fold. In 1983-1990, it is planned to build vegetable-carrying ships and special transportation facilities for small rivers towards fulfilling this task.

A prototype vegetable-carrying motor ship, which is equipped for transporting other cargoes as well, is being built for these purposes at the plant imeni 40th anniversary of October in accordance with plan R168 of the TsTKB [Central Technical Design Office]. With a draught of 1.8 meters its cargo capacity is 690 tons, and with a draught of 2.5 meters it is 1,350 tons. Operation of these ships is possible with a depth of 2 meters, and that makes it possible to use them for transporting vegetables directly from the growing areas.

Prior to commencing and upon terminating a vegetable shipment, vegetable-carrying motor ships can transport wheeled equipment and containers, as well as cargoes fearing the effect of precipitation.

Beginning in 1983 in accordance with plan 19620 of the "Vympel" TsKB [Central Design Office], construction began on vegetable-carrying ships with a cargo capacity of 600-1,300 tons and which are equipped with a technical conditioning system. Two prototype motor ships built in accordance with this plan are undergoing experimental operations on the Volga. The ships are designed for delivering containerized vegetables, and that will improve shipping conditions and improve their efficiency.

The composite bulk-cargo motor ship with a cargo capacity of nearly 600 tons (plan R143) and a hydraulic bending unit is interesting from the point of view of incorporating essentially new technical solutions. With an overall length of 95 meters, the ship can navigate through winding areas of a route with a curving radius of 100-110 meters and a channel breadth of 20 meters. The motor ship doesn't need berths. The form and design of the hull's sections and the availability of ramps as well as an automatic loader with a complete set of gripping devices make it possible to perform loading and unloading operations at an unequipped shore.

New lines will open and the shipping volume of export and import cargoes on mixed navigation "river and sea" ships will increase within the next few years. A fleet of this type becomes principally filled with large motor ships, including a cargo capacity of 4,000-5,000 tons, which the "Krasnoye Sormovo" plant will begin to produce. Deliveries of motor ships and tankers from the NRB [People's Republic of Bulgaria], CSSR and Portugal will continue.

Analysis confirms that operating expenditures relative to a 1-ton cargo capacity for mixed navigation "river and sea" ships are 2-2.5 times and recurring costs are 2 times lower than for maritime ships being operated under similar conditions. In addition, mixed navigation ships of the Ministry of the River Fleet have a lesser molded deck, large hatches, and consequently are better equipped for cargo operations.

The incorporation of transportation and industrial systems on the basis of lighters and ships is one of the ways for increasing shipping efficiency in mixed service.

The TsTKB and TsNIIIEVT [Central Scientific Research Institute of Economics and Operation of Water Transportation] of the Ministry of the River Fleet performed planning and design studies and substantiated the architectural and design class of the lighter-barges and a ship of this kind. The study was performed jointly with specialists from the GDR in the order of scientific and technical cooperation.

The arrangement of barges in a ship in two tiers by loading them through a combined method--by means of docking with the aid of a vertical lift and through moving them along the upper deck on special trolleys--is envisaged for increasing cargo capacity. With a draught of 3.7 meters the cargo-carrying capacity of the lighter is 3,000 tons. The lighter is capable as well of transporting large and heavy cargoes on a special pontoon. It's possible to transport bulk cargoes in a hold which has a watertight hatch cover.

In recent years, a great deal is being done in river transportation to extend the navigational period. The "Wartsila" (Finland) A/O [Joint Stock Company] is building a series of high-power shallow-draught icebreakers for rivers with limited depths. A small draught (2.5 meters) will provide the possibility of substantially expanding the areas of operation. With a power capacity of 3,800 kilowatts in the ship's propellers, the icebreaker will break a trail of ice with a thickness up to 70 centimeters and with a snow cover up to 30 centimeters. The prototype ship "Kapitan Yevdokimov" was put in operation in April, 1983. A total of seven icebreakers of this type will be built.

Equipment for breaking up the ice and clearing it from the channel is being developed by workers of the scientific research and planning and design organizations of the Ministry of the River Fleet. The TsTKB including the NIIVT [Novosibirsk Institute of Water Transportation Engineers] and arctic institute researched and developed an engineering plan for an ice-clearing attachment (plan 2159), and in accordance with which building of the prototype began in 1983.

Blueprints for the LLP-18B icebreaker and clearing attachment, the building of which began in Krasnoyarsk, were produced by the GIIVT [Gorkiy Institute of Water Transportation Engineers]. It is assumed that use of the new attachment, in comparison with the LLP-18 attachment, will increase the speed of ship movement in ice by 10-15 percent.

A large portion of the new transportation self-propelled and nonself-propelled cargo ships, which are intended for operating under conditions of prolonged navigation, are being built with stronger hulls and reinforced propulsion and rudder complexes. Their shipborne systems and units are designed for operating at low air temperatures.

Planned operations were developed for an active ice navigating cargo ship with a cargo capacity of nearly 3,000 tons for the Volga-Kama basin. A ship of this type will navigate in consolidated pack ice with a thickness up to 20 centimeters and in broken ice with a thickness up to 60 centimeters. Operation of motor ships of these types with barges and attachments having a cargo capacity of 6,000 tons is envisaged for efficient use of power during the main ice-free period.

The "Vypel" TsKB developed engineering plan 17431 for a motor ship of the "dead space (ice)" class with a cargo capacity of 2,100 tons for Siberian rivers. Ships of this type will be built at the Krasnoyarsk plant and in Romania.

We are faced with creating cargo ships for replacing the large series ships of the "Shestaya Pyatiletka" and "Bol'shaya Volga" type.

The increase in the material welfare and cultural level of the Soviet people promotes an intensive development in transporting passengers and organizing relaxation for workers. The new tourist motor ships which have become operational provided a high level of comfort for passengers. Construction of them continues, and, moreover, new engineering solutions are being planned.

In 1984, the Austrian "Kornoyburg" shipyard will build the prototype tourist motor ship "Sergey Yesenin" in accordance with plan Ku 065 which was developed jointly by specialists of the shipyard and the Ministry of the River Fleet. Ships of this type ("O" class) with a passenger capacity of 180 persons are intended for navigation on rivers with limited channel clearances such as the Moscow, Oka, Belaya and others.

Studies were conducted by the planning and designing organizations of the Ministry of the River Fleet for comfortable tourist motor ships with a draught of 1.9 meters (with a passenger capacity of 180 persons) and 2.5 meters (with a passenger capacity up to 300 persons) as well as for a passenger ship of "river-sea" mixed navigation. With a draught of 3.25 meters under river conditions this ship will carry 280 tourists and navigate the rivers of the central basins with excursions to the ports of the Caspian, Azov and Black Seas.

Having become operational at the end of the 10th Five-Year Plan, a prototype passenger ship of the plan R132 catamaran type started a new series of ships for intraurban and suburban traffic. According to technical and operating characteristics and comfort, it is advantageously different from its predecessors. At rush hour, large vacant spaces make it possible to take up to 600 persons on board, and that has exceptionally great importance when serving the population on days off and holidays.

In 1983 in accordance with the TsTKB's plan 81080, another prototype passenger ship will be built for intraurban and suburban traffic with a passenger capacity of 170 persons and a speed of 20 kilometers per hour. Series construction of ships of this type is envisaged at the Moscow SSRZ for replacing motor ships of the "Moskvich" and OM type with them.

High-speed ships of the new "Lastochka," "Zenit," and "Luch" types must get out to the passenger routes. Unfortunately, building them is delayed because of difficulties with deliveries of the main engines.

While analyzing the development of RSFSR river transportation, it should be noted that during the last 15 years its cargo capacity has increased by 1.8 percent and the shipping volume increased almost twofold, while the number of



personnel engaged in shipping grew by only 13 percent. This is the result of incorporating scientific and technical achievements and strengthening the material and technical base.

The cargo fleet has changed qualitatively. In comparison with 1950, the average cargo capacity of self-propelled ships increased 2.5-fold and reached 1,612 tons, and nonself-propelled ships increased 2.4-fold and is 1,324 tons. Growth of the cargo capacity made it possible to increase the fleet's utilization efficiency and in some degree to compensate for the negative influence on shipping costs of the considerable rise in shipbuilding costs.

The use of less scarce and cheaper grades of fuel in the fleet became one of the trends for increasing efficiency.

Increasing the reliability of diesels and improving the fuel preparation systems is a primary task during the transfer to heavy diesel fuel. It should be noted that the standard size series of domestically produced diesels is inadequate and does not meet the requirements of river shipbuilding. The new standard size machines are being created slowly. Thus the deadlines are being delayed in creating diesels with a power capacity of 1,000 and 1,500 kilowatts for high-speed ships.

Increased comfort is one of the distinguishing characteristics of ships built as of late. The incorporation of antinoise measures made it possible to reduce the noise level on new ships to the norms or to values close to them. The layout and equipping of living and service accommodations for the crew were improved considerably.

Protection of the ships from corrosion is a big problem. For the fleet alone, annual metal losses from the destruction of corrosion is 13,500 tons. The institutes and TsKB of the industry must increase their attention to this problem.

Enterprises of the Ministry of the River Fleet are performing a considerable portion of the shipbuilding program. Shipbuilding volumes by the industry for the five-year plan must increase by 23 percent. At a number of plants, for example at the Neva SSRZ, this increase is 50 percent.

Tasks on changing to an essentially new system of shipbuilding, the realization of which will make it possible to expedite the process of creating ships and to increase their quality, were assigned for the successful solution of tasks set by a special order of the minister along with increasing the material and technical base of enterprises. A modular method must be taken as the basis for planning and construction. They have begun to use it at the plant in memory of Dzerzhinskiy where a barge platform of plan 81100 was planned and is under construction, and at Limensk and Irkutsk SSRZ's for a barge of plan R171. A barge platform for small rivers was planned as well by the TsTKB of the Ministry of the River Fleet. Barge platforms with a cargo capacity of 3,000 tons have been assembled for several years now by the Osetrovsk shipyard in accordance with a plan of the "Vympel" TsKB, and, moreover, their assembly components,

which are being formed from modular panels, are being supplied by enterprises of the Ministry of the Shipbuilding Industry. Several dozen ships of these types have already been built.

The modular unitized method is incorporated when planning and installing ship-borne power units. Integrated units are being created and used in several ship plans. The Belogorodok and Neva SSRZ's were commissioned to set up the first phase production of these types of units.

The modular method of laying out living and service accommodations is finding ever-increasing application in shipbuilding. With regards to this method, blueprints have been accomplished for laying out the accommodations of a ship for transporting package and piece cargoes and vegetables, and a passenger ship for intraurban and suburban lines.

Broad assimilation of new principles for planning and constructing ships will allow an increase in the industrial level of shipbuilding, ship quality, and their suitability for repair.

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# MARITIME AND RIVER FLEETS

## BREAKDOWN OF USSR MERCHANT FLEETS AS OF 1 JULY 1983

Moscow MORSKOY FLOT in Russian No 12, Dec 83 p 19

[Text] USSR REGISTER OF SHIPPING DATA ON SHIPS OF THE USSR MARITIME FLEET.

Self-propelled ships with gross registered tonnage of 100 or more register tons on the books of the Register as of 1 July 1983 with the distribution of them among the ministries and departments.

(1) Наименование судна	МРБ (2)			МРЗ (3)			Прочие (4)			Всего (5)		
	Количество судов	Валовая регистрационная тоннажность, рег. т	Дедвейт	Количество судов	Валовая регистрационная тоннажность, рег. т	Дедвейт	Количество судов	Валовая регистрационная тоннажность, рег. т	Дедвейт	Количество судов	Валовая регистрационная тоннажность, рег. т	Дедвейт
	(6)	(7)	(8)									
(9) Пассажирские и грузопассажирские	191	627 679	178 708	9	6 355	5 509	67	20 945	3 417	267	654 979	187 634
(10) в том числе:												
(11) пароходы	47	208 490	61 341	—	—	—	—	—	—	47	208 490	61 341
(12) Сухогрузные	1484	8 547 589	11 599 620	541	1 509 437	1 499 519	264	404 807	561 369	2291	10 523 833	13 640 508
(13) лесовозы	366	1 422 818	1 985 825	—	—	—	2	9 628	13 540	368	1 432 446	1 999 385
(14) контейнеровозы	47	410 822	432 755	—	—	—	—	—	—	47	410 822	432 755
(15) роверы	53	368 816	494 636	—	—	—	—	—	—	53	368 816	494 636
(16) Наливные	318	4 414 133	6 761 680	108	243 945	302 415	6	44 213	63 285	432	4 702 291	7 127 380
(17) нефтеналивные	289	4 187 578	6 511 675	89	213 136	267 017	4	40 830	59 965	382	4 441 544	6 838 657
(18) газовозы	11	186 625	201 519	1	614	270	—	—	—	12	187 239	201 789
(19) танкеры	3	9 345	9 960	—	—	—	—	—	—	3	9 345	9 960
(20) Комбинированные	10	625 143	1 085 952	—	—	—	26	70 174	74 221	36	695 317	1 160 173
(21) Рыболовные	—	—	—	2573	3 380 166	1 893 371	4	2 906	1 393	2577	3 383 072	1 894 764
(22) Специального назначения	55	202 331	134 739	210	1 535 400	1 202 435	161	208 900	93 654	426	1 946 631	1 430 830
(23) Технические	204	187 561	150 893	31	18 632	9 769	181	199 405	123 524	416	405 720	264 186

(continued)

(1) Наименование типа судна	(2) ММФ			(3) МРЗ			(4) Прочие			(5) Итого		
	Количество судов	Водоизмещение тыс. рег. т	Дедвейт тыс. рег. т	Количество судов	Водоизмещение тыс. рег. т	Дедвейт тыс. рег. т	Количество судов	Водоизмещение тыс. рег. т	Дедвейт тыс. рег. т	Количество судов	Водоизмещение тыс. рег. т	Дедвейт тыс. рег. т
(6)	(7)	(8)										
(24) Службно-офиц. подготовительные	496	446 076	309 980	337	137 947	93 825	177	76 476	43 513	1010	660 499	446 318
в том числе:												
(25) буксиры	257	92 011	35 336	203	83 291	36 330	105	42 492	17 126	590	217 794	88 792
(26) ледоколы	36	230 646	103 195	—	—	—	—	—	—	36	230 646	103 195
(27) Итого	2758	15 056 634	20 270 572	3809	6 831 862	5 006 843	888	1 089 826	964 378	7455	22 972 342	26 191 793

Key:

- |                                     |                                 |
|-------------------------------------|---------------------------------|
| 1. Types of ships                   | 14. Container ships             |
| 2. Ministry of the Maritime Fleet   | 15. Roll-on/Roll-off ships      |
| 3. Ministry of the Fishing Industry | 16. Tankers                     |
| 4. Other                            | 17. Oil tankers                 |
| 5. In all                           | 18. Gas carriers                |
| 6. Number of ships                  | 19. Chemical carriers           |
| 7. Gross tonnage, register tons     | 20. Combination carriers        |
| 8. Deadweight, tons                 | 21. Fishing ships               |
| 9. Passenger and passenger-cargo    | 22. Special purpose ships       |
| 10. Including:                      | 23. Dredges, etc.               |
| 11. Ferries                         | 24. Service and auxiliary ships |
| 12. Dry cargo ships                 | 25. Tugs                        |
| 13. Timber carriers                 | 26. Icebreakers                 |
|                                     | 27. Totals:                     |

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## MARITIME AND RIVER FLEETS

### PROPOSALS FOR BETTER HANDLING OF PERISHABLE FOODSTUFFS

Moscow MORSKOY FLOT in Russian No 10, Oct 83 pp 12-13

[Article by Yu. Ivanov and P. Gorelyy of the TsNIIMF [Central Scientific Research Institute of the Maritime Fleet]: "The Transportation of Fruits and Vegetables" under the heading: "The Food Program".]

[Text] The USSR Food Program requires not only increasing the production of agricultural products but also providing for its preservation and timely delivery to the consumer.

The presence of foodstuffs in the large cargo spaces of a ship and the passage of the ship through zones with sharply varying air temperature and humidity lowers the quality of the foodstuffs and in some cases causes its spoilage. For these reasons, a scientifically substantiated standardization of the technology for transporting foodstuffs is necessary.

In connection with the expansion of the volume and the kinds of haulage and the qualitative changes in the composition of the fleet (the introduction of Roll-on/Roll-off ships, container ships, lighter carriers, railcar ferries, and other specialized ships), and for the purpose of preserving cargoes and the safety of transportation, the TsNIIMF has developed a comprehensive system for standardizing the technology of the maritime transport of all kinds of cargoes.

This system, in the part about the preservation of cargoes, incorporates rules for the maritime transport of delicate cargoes. The rules are made up of: the general rules for the maritime transport of delicate cargoes, the rules for the maritime transport of delicate cargoes on various kinds of ships (ventilated ships, refrigerated ships, lighter carriers, refrigerated containers), and the special rules or charts of the technological conditions which regulate the features of transporting specific cargoes on defined routes.

The introduction of the standardizing system into fleet operations will increase the preservation of consignments of foodstuffs of all kinds in the existing and prospective methods of maritime transport. It will facilitate the use of standardizing documentation, and will provide for a more effective utilization of the domestic fleet in safely transporting foodstuffs in increasing amounts.

The latter proposition is especially important. The introduction of documents regulating the safe haulage of these cargoes on general-purpose ventilated ships and Roll-on/Roll-off ships has been conducive to increasing the volume transported by domestic tonnage. As an example, there is the shifting of a part of the traffic in refrigerated cargoes on to Roll-on/Roll-off ships in the shipment of citrus fruit from Cuban to Baltic ports in accordance with a technology developed jointly by Soviet and Cuban specialists. A feature of this technology is that the fruit is transported without cooling. Now, 10,000 to 15,000 tons of citrus fruit is being delivered by Roll-on/Roll-off ships in this way annually.

It is planned to use this method for the growing volumes of fruits and vegetables being transported from Vietnam to ports in the Far East basin.

Providing the fleet with a standardized basis, however, does not always have the proper effect. Shortcomings connected with unimproved, old, traditional methods of transportation still remain.

In the first place, there is the low intensity of cargo operations in ports because of the large amount of unpackitized individually packaged freight, and the necessity of reweighing the whole cargo in domestic ports (instead of the five percent adopted in world practice).

Secondly, deficiencies in specialized transportation equipment have an adverse effect as also does the absence of on-shore thermally insulated complexes for the transshipment of fruits and vegetables under any weather conditions.

Thirdly, far from all foodstuffs are presented for maritime transportation in a package conforming to international and state standards.

In addition, organizational and technical questions have not been resolved between the appropriate ministries on the transfer of freight from one kind of transportation to another (or to users) in large-volume units which is delaying the introduction of containerized and packetized transport of foodstuffs in maritime transportation.

To provide, by means of domestic tonnage, for the sharply increasing volume of foodstuff cargoes, apparently, the fleet should be reinforced with refrigerated ships.

It is especially important to resolve the question of organizing the transport of perishable cargoes in all kinds of transport in refrigerated containers. In this complex problem, the necessary stock of containers and their optimal type must be determined and also the economic advisability must be considered of building them in our country or purchasing them abroad.

In our opinion, refrigerated containers should belong to the cargo owner and be presented for transportation under the seal of the shipper. It is preferable to transport refrigerated containers having electrical drives in view of the possibility of connecting them to shipboard and on-shore power

supplies. Such containers are being transported right now on Roll-on/Roll-off ships, container ships, and several other kinds of ships. The possibility of shipment in containers of other types such as thermally insulated and autonomous refrigerated containers with mechanical cooling, containers using liquid nitrogen as the coolant, and others is not excluded.

The creation of a unified chain of refrigeration with constant temperature and humidity conditions from the place of production to the consumer will provide optimum conditions for the safe delivery of perishable products to the public and will sharply reduce the difficulty of cargo operations at transshipping points.

A solution of the question of the containerization of perishable products is being delayed at present by the unpreparedness of the rolling stock and stations of the Ministry of Railways to transport refrigerated containers.

It is advisable, in our opinion, to create an all-department expediting organization (coordinating center) to implement control over the movement of perishable cargo from the place of production to consumers and to coordinate the work of all the kinds of transportation. The experience of the Lenin-grad transshipment center in the transfer of cargoes, especially foodstuffs, from one kind of transportation to another deserves to be spread around.

The absence of specialized refrigerated cargo transfer complexes in ports of transshipment, because of weather conditions, leads to prolonged idleness of ships in awaiting refrigerated units or for other reasons that have an adverse affect on the quality of the cargo. It is necessary that Minplodovoshchkhov [Ministry of Fruit and Vegetable Industry] accelerate the construction of refrigerators and fruit and vegetable storages at transshipment points.

The refrigerated warehouses in Kherson and Kaliningrad at present are not being operated efficiently. Responsibility for the loss of quality in products during their presence in a storage is being placed on the carrier unjustifiably. No norm for spoilage has been specified for the short-term storage of cargoes in these warehouses.

It is very important to resolve more quickly the question about accepting, without taking responsibility for cargo quality, fruits and vegetables with more than 4 percent spoilage from maritime transport on to other types of transportation, or by a recipient, in special conditions. As a rule, in each specific case this question, no matter what, is being resolved after extended discussions and correspondence between the various ministries and departments which only promotes prolonged idleness of ships and further spoilage of cargoes because of delay in unloading.

One of the most important factors in preserving cargoes is the quality of the containers or packaging, especially in maritime transportation of fruits and vegetables where dynamic loadings can exceed by a factor of ten the static loadings characteristic of on-shore warehouses. Meanwhile, the shipper frequently violates the requirements of operative state standards for

containers and packaging especially in the shipment of cargoes to the distant regions of the Extreme North or Far East. The same situation sometimes arises in the transport of imported products in containers that do not protect the cargo in transit or in transshipment. The Ministry of Foreign Trade does not always coordinate with the transportation ministries the container and packaging part of purchasing contracts for fruit and vegetables.

Today, unfortunately, all packaging of perishable products is being broken open in the ports for the purpose of determining quality. That brings to naught all the advantages of the packaging and containerization of fruit and vegetable cargoes in the maritime fleet.

With regard to the necessity for further growth in packetized and containerized transport, it is advisable to legalize the top priority transfer of foodstuffs to the recipient (or to another kind of transportation) in large-volume units without opening them in the ports.

At present, the intensity of cargo operations is being reduced to a significant degree by the necessity to reweigh all fruit and vegetable cargoes in the ports of destination. On the initiative of the Ministry of the Maritime Fleet and the Ministry of Foreign Trade a number of parallel operations are being carried out right now on the reweighing of 100 percent or 5 percent of cargoes in order to determine the convergence of the results. A decision of this question for the 5 percent selective reweighing of fruit and vegetable products, as accepted in world practice, will increase the intensity, and reduce the labor consumption, of cargo operations by 15 to 20 percent, and, consequently, increase the carrying capacity of the fleet.

Solution of the problems which have been touched upon will permit successfully resolving the tasks put before the maritime fleet by the Food Program, will increase the efficiency of its work, will accelerate the development of the containerized transportation system of the country, and will expand the transport of individually packaged cargoes by the packetizing or containerizing method.

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## MARITIME AND RIVER FLEETS

### BRIEFS

**TUYAMUYUNSK RESERVOIR SHIPPING ROUTE** -- Yesterday, for the first time, a caravan of ships was conducted via the Tuyamuyunsk reservoir to the border of Turkmenia and Uzbekistan. Freight transport to these distant krays by water is significantly more economical than by motor vehicle or railroad. Next year freight traffic over the Tuyamuyunsk reservoir is projected to reach 200,000 tons. (TASS) Chardzhou. [Text] [Moscow VODNYI TRANSPORT in Russian 1 Dec 83 p 4] 9136

**LIGHTER TRANSPORT TO SAKHALIN** -- Lighter transport across the Tatar Strait has begun. The first lighter, conducted by two tugs, has completed the crossing from Vanino to Uglegorsk. The 100 kilometer distance was covered in 12 hours. Self-propelled barges plying this same route require much more time. "To send large ships over such a short distance is uneconomical" says the chief of the port of Vanino, V. Bykov, "There are large expenditures for the amortization of equipment and its maintenance. Ten lighters completely replace a large-tonnage ship, yet the time for loading and unloading them is less by half. In addition, the lighter does not need a crew. At sea the crew of the tug looks after it." Because of putting the new freight crossing into operation, the intensity of operations at the Vanino transshipment center is growing. (TASS) Vanino. [Text] [Moscow VODNYI TRANSPORT in Russian 3 Dec 83 p 4] 9136

**REORGANIZING RIVER TRANSPORT ADMINISTRATION** -- For the purpose of fundamentally improving operations in the preparation, selection, and training of personnel afloat, in the organization of passenger transport, and in increasing the safety of navigation, the Administration for Passenger Transport of the RSFSR Ministry of the River Fleet is being transformed into the Main Administration for Passenger Transport in which the following departments are being created: transport organization, terminals and passenger services, and the economics and planning of transport. The Administration for Personnel and Educational Establishments is being transformed into the Main Administration for Personnel and Educational Establishments. In it will be departments for supervisory, engineering and technical personnel, for work with personnel afloat, for work with personnel who navigate or travel beyond the border, for worker personnel, record-keeping and awards, and for planning and finance. In the Main Inspectorate for the Safety of Navigation, the following departments will begin to function: ship inspections and port supervision, Standardized documentation, and ship navigation and navigational aids. [Text] [Moscow VODNYI TRANSPORT in Russian 3 Dec 83 p 3] 9136

SOVIET-BULGARIAN SHIPBUILDING COOPERATION -- The flag of the Soviet Countries will be raised on a dry cargo ship built to Soviet order at the shipyard imeni G. Dimitrov in Varna. The new ship has been named for the noted Soviet singer Sergey Lemeshev. Soviet-Bulgarian collaboration in the field of shipbuilding is developing along a rising curve. Coming from the building ways of the shipyards of the People's Republic of Bulgaria are tankers, container ships, and floating engineering equipment which have received a high evaluation for reliability in the USSR. In turn, in Bulgaria, Soviet cargo ships, trawlers, floating drydocks and tugs are being used. Soviet "Meteor" ships ply the passenger routes on the Danube and the Black Sea coast of the country. As a result of joint development by Soviet and Bulgarian designers, the production of several kinds of shipboard equipment has been set up in both countries. Using the experience of the friends from the USSR, workers at the Varensk plant for radio navigation equipment have developed two types of radio sets which are being installed on ships being built to Soviet orders. The personnel of the Institute of Ship Hydrodynamics at Varna are of great assistance to USSR shipbuilders and also to the other countries who are members of the SEV [Council of Mutual Economic Cooperation] [Text] [Moscow VODNYI TRANSPORT in Russian 6 Dec 83 p1] 9136

SMALL-CRAFT FACTORY -- In the village of Samus construction has begun on a shop for building small craft. During the navigation season rivermen of the Western Siberian Steamship Company delivered more than 300,000 cubic meters of sand here for grading under the future shop. (Our special correspondent) Samus, Tomsk oblast. [Text] [Moscow VODNYI TRANSPORT in Russian 13 Dec 83 p 1] 9136

SHIPS ON SHIPS -- The large motorship "Georgiy Pyasetskiy" has been sent on a long voyage. In the hold and on deck is a great variety of products - "Belarus" tractors, light motor vehicles, and two "Baltika" class Trawlers. It is not the first time that Baltic seamen have transported ships on a motorship. The crew of "Dekabrist" initiated such economical voyages. [By A. Alyushinskiy] Leningrad. [Text] [Moscow IZVESTIYA in Russian 15 Dec 83 p 3] 9136

SHIPS WITH AUXILIARY SAILS -- The Caspian Central Planning and Design Bureau has set about developing a project to equip the ships of its steamship company with auxiliary sails. This work has been recognized as promising for our sector of industry. (Our special correspondent) Baku. [Text] [Moscow VODNYI TRANSPORT in Russian 22 Dec 83 p 1] 9136

NEW CONTAINER CARRIER -- A speed-up in the transshipment of cargoes and a reduction of layover time in ports - such are the results of the appearance on the Riga-to-Rostok (GDR) shipping line of a container carrier of the new "Kapitan Tomson" class. Ships of this type are faster and have almost double the cubic capacity of the former ships. Similar motorships are appearing on the line under the GDR flag. (TASS) Riga. [Text] [Moscow VODNYI TRANSPORT in Russian 22 Dec 81 p 1] 9136

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## PORTS AND TRANSSHIPMENT CENTERS

### MINISTRY OFFICIALS ON PLAN FOR IMPROVING PORT OPERATIONS

Moscow VODNYY TRANSPORT in Russian 24 Dec 83 p 2

[Article by I. Orlov, deputy chief of Glavflot MMF; V. Bel'kovets, chief of the port department of Glavflot; and Yu. Dmitriyev, department chief of "Lenmorniprojekt": "Improving the Economic Mechanism: A Full Load on the Ports"]

[Text] MMF [Ministry of Maritime Fleet] has approved a regulation entitled "On Organization of the Processing of the Dry Cargo Fleet in Seaports and Port Points of MMF." This document, whose purpose is to increase the operating efficiency of the fleet and ports, was drafted by Glavflot [Main Administration of Shipping and Fleet and Port Operation] of MMF and "Lenmorniprojekt" [Leningrad Affiliate of the State Project Planning, Design and Scientific Research Institute of Maritime Shipping] with the assistance of an extensive group of representatives of ports and shipping companies.

The new regulation went into effect this October in the ports of Leningrad, Odessa, Ilichevsk, Nikolayev, Belgorod-Dnestrovskiy, Zhdanov, Reni and Izmail, and this coming January it goes into effect in all other ports of MMF. It calls for certain changes in the procedure for introduction of NPGRP [continuous schedule-plan of port operations], the set of standards and quotas, and the system of mutual settlement for the lay time of vessels, which were previously in effect. Their introduction into the system of the organization of the processing of vessels is backed up by an analysis of port operation over many years, it takes into account the present state and prospects for development of the plant and equipment of the fleet and ports, the system for management of port operation, and the level of interbranch coordination of the transportation process, and it relies on the higher professional skill of the workers and the qualifications and experience of engineering and technical personnel and supervisory personnel of shipping companies and ports.

The new regulation, which developed from documents previously in effect, presupposes organization of the processing of vessels in the port on the basis of the continuous schedule-plan (NPGRP) and is directed toward achievement of the principal goal--reducing the lay time of the fleet in port and guaranteeing the handling of the planned volume of cargo transshipment. The main way of achieving this goal is fuller use of the productive capabilities of the ports.

The set of norms and standards for introduction of the NPGRP define the productive capabilities of the port and are based on the traffic capacity of transshipment complexes. They include the standard governing the number of transshipment complexes of the port in operation at the same time, consolidated quotas for the handling of vessels, as well as standard times for performance of auxiliary operations.

The standard number of transshipment complexes (NPK) affords the possibility of determining by quarters in the planning year the number of vessels handled at the same time in the port so as to take into account the maximum interchangeability of cargo-handling complexes. This guarantees fulfillment of the plan assigned to the port for cargo handling and the consolidated quotas for the handling of ships. This standard, which is cleared with the shipping company, is assigned to the port by MMF. It is easy to monitor fulfillment of the NPK.

The use of consolidated standards for the handling of ships is based on the actual traffic capacity of the port's transshipment complexes. Essentially this is the gross standard allowance for handling of vessels on berth. Use of the consolidated standards affords the port itself of regulating within a definite range the rate of loading or unloading of a particular vessel, that is, so as to take into account the operational situation in the transshipment center. The possibility arises of evaluating the port's performance on the basis of the total (for the month) indicators of results in the handling of vessels, which gives the ports an incentive not so much to achieve record figures for individual vessels as to improve the overall system of operation.

The consolidated standards are expected to ensure on the whole an 8-10-percent higher rate of vessel handling. This is achieved thanks to optimum concentration and high productivity of mechanized lines. This takes into account possible interruptions in the loading and unloading of a vessel because of weather conditions, which makes it possible to determine from the outset the most likely length of time the vessel will be on berth, and consequently, to increase the stability of the times allotted for handling the vessels, the stability of the NPGRP, and the reliability of the NPGRP. In essence, from the standpoint of the handling times set forth in the NPGRP, the tramp vessel is put on a par with the line vessel which operates according to an agreed schedule.

The new standards set the productive capabilities of the port and are the principal indicators for delimitation of responsibility for the lay time of the vessel between the port and the shipowner. They make it possible to clearly ascertain the productive capabilities of all ports in the sector and to resolve more effectively the questions of their specialization, the lines of development of port operations, operational management of the ports (assignment of the fleet, railroad car plans, regulation of the load on the ports). Certain changes are being made in the system of mutual settlement concerning the lay time of the fleet aimed at enhancing the responsibility of the shipping company, as the principal multiactivity enterprise in the sector, for the handling of all vessels in ports under its jurisdiction.



The ports settle accounts on the basis of the results of handling the vessels as follows: for Soviet vessels--with the shipowner, for all foreign vessels--with the shipping company to which the port is subordinate.

Lay time for all vessels is calculated according to the consolidated standards and the standard times for performance of auxiliary operations assigned to the port. The shipping company to which the port is subordinate obtains settlement for the handling of foreign vessels from the V/O [All-Union Association] "Sovfrakht" and the all-union associations of MVT [Ministry of Foreign Trade] and GKES [State Committee for Foreign Economic Relations].

Introduction of the new regulation on organization of the handling of vessels will make it possible to achieve a sizable economic benefit. Calculations made by "Lenmorniprojekt" together with representatives of the ports showed that the benefit will exceed 10 million rubles.

A most important task in this stage is to make thorough preparation of the operational personnel of the ports and shipping companies for introduction of the new normative documents. To this end Glavflot has already held instructional conferences and made inspections and a thorough analysis of the operation of ports and shipping companies making the transition to operation under the new system as of 1 October 1983.

The work that has been done constitutes the first stage in improving the set of standards and methods for organization of the processing of the fleet in ports. Then, according to the plan of the research to be done by "Lenmorniprojekt" under the supervision of Glavflot, the drafting of documents aimed at further improvement of the effectiveness of handling vessels of Minmorflot will continue, including a regulation on procedure for handling foreign vessels and making settlement for dispatch (demurrage) of such vessels under charter to foreign charterers to carry cargo in foreign trade.

The drafting of the higher new standards for the handling of dry cargo vessels in ports of clients will be completed in 1984. The higher standards for the handling of tankers in seaports and port points, which are to replace those now in effect, are being prepared to take effect in 1985. Recommendations will be prepared concerning the standards governing the handling of Soviet vessels in foreign ports.

The projects to be performed take into account replenishment of the maritime fleet with new types of vessels, development of the technology for performance of cargo-handling operations and auxiliary operations, and changes in the classification of cargo flows to be handled.

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## PORTS AND TRANSSHIPMENT CENTERS

### SOLUTION FOR VANINO--SAKHALIN RAIL 'BRIDGE' PROBLEMS

Moscow GUDOK in Russian 28 Dec 83 p 2

[Article by V. Babichev, deputy chairman of the oblispolkom, chairman of the oblast Commission for Coordination of the Operation of All Branches of Transportation, Yuzhno-Sakhalinsk: "The Sakhalin Version"]

[Text] Sakhalin is an oblast that is an island. An island, moreover, with the country's only railroad with a gauge of 1,067 mm. Previously freight was carried between the mainland and Sakhalin only by maritime vessels. Of course, that made it impossible to guarantee stable transportation services to enterprises. That is why the decision was made to build a reliable year-round "bridge" between the island and the mainland--to install the railroad sea ferry between Vanino and Kholmsk. Activation of the first phase of the ferry made it possible to improve transportation service to Sakhalin and to make the ordinary vessels available for other shipping.

As the flow of freight increased, it became more difficult to transship the freight at the Kholmsk station from the wide-gauge to the narrow-gauge cars. Fundamentally new solutions were needed.

The railroad personnel of the Sakhalin division proposed an original solution--to deliver the freight to enterprises in cars of the general system without reloading in Kholmsk. Today an operation has been organized at that station to put the cars on trucks with a gauge of 1,067 mm.

Of course, a number of complicated technical problems had to be solved to mesh the activity of railroads with different gauges. The greatest one was how to get the cars through tunnels. After all, their roofs are wider than the tunnel opening. In addition, it was necessary to ensure traffic safety on a track almost one-third more narrow and to achieve stability of the track on weak foundations. According to calculations, the axle load of the cars increased 25 percent, and the load per meter 50 percent.

A way out was found. Specialists of VNIIZhT [All-Union Order of Labor Red Banner Scientific Research Institute of Rail Transport] worked out a specific method of calculating clearances. It took into account the dynamic characteristics of the cars, the plan and arrangement of the track, and the traffic speed. The track was lowered in tunnels and in approaches to them, the rail-tie track skeleton was reinforced, and the lower part of tunnel arches was

strengthened. That opened the way to Sakhalin for cars traveling the entire rail network. It became possible to take even boxcars with a box capacity of 120 cubic meters. For the first time in world practice an axle load of 21.6 tons and a load per meter of 6.2 tons were achieved on this kind of track.

The numerous comprehensive tests of cars from the general system on the narrow-gauge trucks made it possible to create a reliable technology for preparing them for the runs. The technology guarantees safe operation when the track plan and profile are complicated and under extremely difficult weather conditions. Rules have been worked out for the movement of the cars which protect the track from damage and residual deformations.

Today there is not a single sector of the economy on Sakhalin which would not reap a gain from introduction of the new transportation technology. Now freight arrives from the mainland incomparably faster than before. The traffic carried by the ferry, for example, has increased ninefold. The productivity of port personnel has doubled. The shipping cost per ton of freight has dropped 20 rubles. Standard inventories of materials in the pulp and paper industry have been cut in half. The freight arrives in better condition. And on the whole the annual economic benefit for the principal sectors of the economy in the oblast has amounted to about 7 million rubles.

The successful introduction of the technology without transshipment provides an impetus for its further development. A decision has been made to build the second phase of the ferry. This will make it possible to transfer all Sakhalin shipping to rail transport.

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## PORTS AND TRANSSHIPMENT CENTERS

### PORT PERFORMANCE WRAP-UP FOR NOVEMBER 1983

Moscow VODNYY TRANSPORT in Russian 20 Dec 83 p 1

[Text] Transshipment centers made November notable for their coordinated effort. They were helped in this by reduction in seasonal traffic of freight and cargo for the regions of the Far North and by completion of delivery to consumption points of farm products from this year's harvest. With the exception of three northern transshipment centers (Arkhangelsk, Murmansk and Magadan) they all fulfilled plans for November. More than 17 million tons of freight and cargo were transshipped, and the plan was fulfilled at a level of 104.7 percent. The assignment for export freight was fulfilled at 93.3 percent. The ports received 14,800 fewer railroad cars than planned. The assignment for transshipment of coastwise cargo was fulfilled at 115.6 percent.

The Baltic transshipment centers, where Kaliningrad, Tallinn and Klaypeda achieved the highest figures for transshipment, achieved steady operation. In the Southern Basin the transport workers of Odessa, Taganrog, Yuzhnyy, Feodosiya and Batumi achieved better figures than others. The Caspian transportation workers distinguished themselves in November: the Baku transshipment center fulfilled the plan at 104.9 percent, Makhachkala at 115.3, and Bautino at 111.6 percent.

In November the plan for shipment of import cargo was fulfilled at 116.6 percent in terms of tons and 96.7 percent in terms of cars. The ports received about 3,000 fewer cars than planned. At the same time there were cars not processed in good time (138 units). The plan was fulfilled for delivery of dry bulk freight (103.8 percent) and metal (110 percent). Cars delivered to be loaded with pipe amounted to 97.6 percent of the plan, and only 75 percent were delivered of those requested to be loaded with perishables and other produce.

Over the month the cargo standing in ports increased by 190,000 tons. Certain transshipment centers experienced difficulties because of delayed ship arrival. In all, 127,000 tons of cargo did not arrive according to the monthly schedule. The ports received less perishable cargo, above all citrus fruit, than was planned. At the same time, 164,600 tons of pipe arrived in November over and above what was planned.



This situation is not an exception. The conditions for shipment and specific obligations in foreign ports cause irregularity in the arrival of import cargo at the ports. What should the transportation workers do under these actual conditions? Since the common task of the seamen and railroadmen is the speediest delivery of freight to consignees, it is obvious that domestic shipments need to be carried more flexibly, especially since in general it is a question of relatively small deviations from the plan, and sometimes it is merely a question of plan discipline. For example, in November the Baltic ports received 75,000 tons of pipe and metal more than was scheduled, while at the same time the October and Baltic Railroads delivered 1,200 fewer cars than planned. The "Regulation on the Transshipment Center," agreed to by the four transportation ministries, defined two indicators for planning joint operations: the volume of freight passing through the base enterprise of the transshipment center, and achievement of the standard rate of processing of transportation equipment. The problems that arise in practical application of these indicators need to be jointly examined in detail at the local level.

Transshipment centers should pay closer attention to efficient use of the new freight-handling equipment, in particular to weighing bulk cargo with electronic weighing devices. And port personnel in Leningrad, Novorossiysk and Nakhodka should complete in the shortest time preparation of electronic scales for permanent operation.

As they complete the third year of the 5-year plan, transportation workers must draw lessons so that they begin the next year in a better-organized fashion.

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## PORTS AND TRANSHIPMENT CENTERS

### BRIEFS

AMUR RIVER PORT -- Construction of the Komsomolsk-on-Amur river freight port is in the final stage. The state commission has accepted the main object of the construction - the 360-meter pier wall - for operation. The builders have completed the main item of the holiday commitments with honor. The first ships will make fast to the pier at the beginning of the 1984 navigation season on the Amur. About five million tons of freight being sent from the central regions of the country to Kamchatka, Kolyma, and Chukotka will be transshipped here every day. Komsomolsk-on-Amur. [Text] [Moscow IZVESTIYA in Russian 28 Oct 83 p 1] 9136

ODESSA CONTAINER TRANSSHIPMENT PIER -- A complex for processing cargoes in containers was put into operation yesterday in the commercial port of Odessa. Because of it, the throughput capacity of the harbor is increased by a half million tons of freight per year. Constructors built a deep-water pier which can receive large-tonnage ships of all types. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 1 Nov 83 p 1] 9136

RIGA'S RIVER PORT EXPANSION -- The new freight section of Riga's river port has accepted the first ships. Tugs delivered barges here loaded with raw materials and construction materials for new buildings in the capital of Latvia. A significant increase in the volume of river transport in the republic has been specified in the 11th Five-Year Plan. Accordingly, the expansion of Riga's river port is being continued. New piers and transshipment complexes are being built right at the receiving enterprises. (TASS) [Text] [Moscow VODNYI TRANSPORT in Russian 1 Nov 83 p 1] 9136

TYUMEN MECHANIZED PIER -- A section of the sandy left bank of the Nadym river has been clothed in steel and concrete after the completion of the first dispatch point of the mechanized pier here. The complicated hydro-technical structure provides for processing ships of any type. The pier will accelerate the delivery of cargoes in the developing region. [By V. Kamitov, Tyumen oblast.] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 10 Nov 83 p 1] 9136

TRANSSHIPPING SOFT CONTAINERS -- For the first time in the history of the port of Odessa, in the second port area carbamide in soft containers was transferred from a ship to a lighter. Formerly, cargoes in such containers were transferred to warehouses. When the port's chief dispatcher reported that the motorship "Gurzuf" was expected with a cargo in soft containers, the senior dispatcher of the second port area, A. Zidrashko, proceeded to prepare to receive carbamide and decided to place "Gurzuf" alongside a DM-100 lighter and transfer the cargo to the lighter. Dock workers of the 264th brigade under the leadership of foreman, V. Plitus, and team leader, A. Marushan, managed the job very well. In four hours 544 ton of carbamide was transferred while the norm for eight hours is 574 tons. [By A. Krikunov, stevedor.] [Text] [Moscow VODNYI TRANSPORT in Russian 17 Nov 83 p 2] 9136

CHINESE VISIT -- In October and November of 1983 a delegation of specialists from the People's Republic of China visited the Union of Soviet Socialist Republics. During the three week stay in the USSR the Chinese delegation visited the cities of Moscow, Leningrad and Odessa and acquainted themselves with the work of a number of subdivisions of the Ministry of the Maritime Fleet, the Baltic and Black Sea Steamship Companies, and the ports of Leningrad, Odessa, Il'ichevsk, Yuzhnyy, the RSFSR Ministry of the River Fleet, and the port of Yuzhnyy in Moscow. The Chinese specialists studied the structure of the productive interrelationships between Ministry of the Maritime Fleet enterprises and the coordination of their activities with other interfacing kinds of transportation and clients. The agreed program for the stay of the Chinese specialists in the USSR was fully completed. All meetings went on in friendly circumstances. The delegation noted the usefulness of the work carried out and expressed a desire to develop collaboration in the interests of both sides. After a brief visit to the GDR, the Chinese delegation left Moscow for home. [Text] [Moscow VODNYI TRANSPORT in Russian 24 Nov 83 p 1] 9136

CARTONS FOR EDIBLE FATS -- In the port of Odessa a consignment of food products was loaded onto the motorship "Nikolay Shchors" for the island of Svoboda. It would seem to be an ordinary loading, but it was experimental. Edible fat has been transported on seagoing ships in a traditional container - in wooden boxes. They are complicated and costly. At the Zaporozh'ye wooden box factory they developed a new pressed-carton container for edible fat. Such a container is easily combined with standard containers on pallets. Although, in the loading process, certain deficiencies in the design of the new method of packaging the cargo were revealed, it undoubtedly has a great future. A. Bondareva (our special correspondent). [Text] [Moscow VODNYI TRANSPORT in Russian 22 Nov 83 p 1] 9136

FLOATING DRYDOCK FOR OMSK -- Irtysh rivermen have received a first-rate present from Klaipeda shipbuilders. After a protracted ferrying over the space of five seas and large Siberian rivers, a floating drydock built by the people of Klaipeda for the permanent use of the rivermen has come into Omsk. It is capable of lifting several motorships on its "back" simultaneously and it will be of great assistance to Omsk ship repairers. The giant floating shiplift will accelerate repair of the underwater part of ships approximately two-fold. Such a labor consuming operation as the rais-

ing of a ship which now occupies a whole day at a shipyard slip, will be done here in an hour. Preparation of the newly arrived dock is now going on. [By E. Chernyshev, Omsk.] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Dec 83 p 2] 9136

NEW VYBORG PIER -- Yesterday the first ship made fast at the Vysotska piers - a new area of the port of Vyborg. The motorship "Angarskles" delivered large-diameter pipes here from Hamburg. The new Vysotska piers have the last word in equipment and they significantly expand the capabilities of this port in the Gulf of Finland. Ships with a draft of more than eight meters can now come here as against six and a half meters for the piers in Vyborg. The two piers which have been put into operation will permit the port to increase cargo turnover by 400,000 ton per year. [By V. Sergeyev, Vyborg.] [Text] [Moscow VODNYI TRANSPORT in Russian 22 Dec 83 p 1] 9136

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